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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Trade Situation

THE chemical trade returns for August, published last week, indicate that the industry seems to have recovered fully. In order to obtain a clear view of the position, it is worth while considering the figures in detail. The exports of ammonium sulphate amounted to 24,371 tons, as against 10,757 tons in 1926, and 19,982 tons in 1925. These figures speak for themselves. Further analysis shows, that while in one or two instances, exports of ammonium sulphate are not up to the 1925 standard, exports to Japan have increased from 3,882 tons in August of that year to 9,815 tons in 1927. This is some indication of the enormous market which awaits this product in the East. The establishment of a strong, sane government in China would probably have an astonishing effect on the situation: if and when the Chinese problem is settled, there will probably be a real boom in sulphate of ammonia exports from this country. There is another aspect of the export of this product which deserves notice. The quantity exported in August, 1927, was greatly in excess of that exported in August, 1925: yet the value was less—*i.e.*, £228,469 as compared with £236,950. The heavy reductions which have been made in the price are well known to all; but the figures quoted above drive home the reality of the reductions in a remarkable manner.

It may be thought that the attention which we are paying to this particular product is excessive. Ammonium sulphate may, however, be regarded as a good test-case. Its production from atmospheric nitrogen on the large scale is an operation requiring technical skill of a high order. Its sale abroad must face keen competition from products made elsewhere. In spite of all these obstacles, its sale is increasing—a remarkable tribute both to British chemical industry and British salesmanship. Considerations of a very similar kind apply to another product, sodium carbonate. Perusal of the August returns indicates that exports of sodium carbonate (including soda crystals, soda ash and bicarbonate) during the month were 398,950 cwt., as compared with 436,256 cwt. in 1926, and 382,642 cwt. in 1925. The corresponding values were £118,777 in 1927, £132,108 in 1926, and £117,044 in 1925. Painters' colours and materials were exported to the extent of 127,195 cwt., as compared with 141,241 cwt. in 1926, and 123,765 cwt. in 1925, the corresponding values being £302,423, £329,295, and £295,867. Finally, in the field of dyes and dyestuffs (products of coal tar), exports in August of the last three years have been 6,572, 3,373, and 7,452 cwt. respectively, with values of £52,702, £34,525, and £57,728.

A consideration of the figures published for August in the last three years (it being kept in mind that in some instances the strike last year, owing to a fear of shortage of important products, led to a temporary paradoxical increase in exports) shows, therefore, in regard to most of the products which have been considered, a steady expansion in trade. This country is therefore not falling behind in the race for the world's markets. To this state of affairs two things have contributed. In the last few years the scientific basis of the industry has been strengthened. There are still those who insist that even now there is room for improvement. While enthusiasm of this kind can lead to nothing but good, it ought not to blind us to the fact that immense advances have already been made in this direction. The second factor which has been of influence is the improvement in the handling of markets. For some years after the war, our competitors in foreign markets seemed to use more effective methods than our own. A perusal of the export figures for August indicates eloquently that this reproach can no longer be made. For this happy result thanks may be offered not only to the enterprise of our manufacturers, but also to the activities of the Department of Overseas Trade, which has co-operated gallantly in every effort to extend trade. Another indication of the improvements which have occurred is the interest which is being taken in exhibits of British goods. The Shipping, Engineering and Machinery Exhibition (some of the exhibits at which are described in detail in this issue)

has just shown the world some excellent examples of the products of British industry. This is done on an even wider scale by the British Industries Fair, which, year by year, goes from strength to strength, and which, it is already certain, will eclipse all previous records in 1928.

It may be fairly claimed that the chemical industry of Great Britain has shown a remarkable example, not only to the world at large, but also to other British industries. It shared with the latter all the handicaps and disadvantages of the last few years. Its advance is a clear vindication of the application of science to everyday affairs. The future holds out great hope. The great triumph of the industry of synthetic nitrogenous compounds is only a single example of other triumphs yet to come. Enormous new branches of industry are springing up almost daily. It may be that in the early post-war days this country was somewhat slow in starting. Now, however, that a proper start has been made, it seems that Great Britain is once more to take up her traditional position—that of leader in the race.

The Economics of Scientific Control

DR. E. W. SMITH, in the William Young Memorial Lecture which he delivered to the North British Association of Gas Managers on the occasion of their recent meeting at Dumfries, took as his subject "The Economics of Scientific Control in the Production of Town's Gas," a subject capable of a much wider application than the title suggests. It concerns the chemical industry generally no less than the gas industry. The production of town's gas is a chemical operation involving knowledge of chemistry, physics, and engineering of a high order. It demands a scientific attitude of mind in many other directions. Sales of industrial gas depend (1) On the cost of gas; (2) On the development of scientific methods in the utilisation of gas; and (3) On scientific methods for increasing the sales of gas. Equally, in the matter of labour, its control and its welfare, there is evidence in the many co-partnership, superannuation, and other such schemes that some gas companies have adopted, and that others are beginning to adopt, of something approaching a scientific attitude of mind.

Although there has been, of recent years, a marked advance in the application of scientific control in the chemical industry, there is room for still further improvement. This application, as Dr. Smith justly suggests, needs to be made from the top to the bottom, to the limit of what is practicable under existing conditions. There is just as great a need for scientific methods in the organisation of an undertaking as a whole as there is in the control of a specific chemical process. The manager must exhibit a scientific attitude of mind in making his decisions, whether in the purchase of raw materials, the adjustment or correction of difficulties, or the appointment of his staff. Equally, the engineer and accountant must not lack the scientific mind; they must be imbued with the courage, the imagination, the knowledge of the industry, and the clear insight which alone can ensure the attainment of the desired objective. Dr. Smith stressed the point that chemical and physical control, as well as the data and statistics obtained relative to any chemical product, are wasted and futile unless those whose business it is to make use of such information have a scientific attitude of mind, and are capable of applying the information properly.

As regards the cost of chemical testing, in so far as the progressive gas undertakings are concerned, Dr. Smith suggests that the average cost, including everything, amounts to approximately one-thirteenth of a penny per therm. Special chemical research does not amount to more than one-hundredth of a penny per therm. What about the economics, the value, of scientific control? This is not easy to appraise in monetary terms. Like advertising, its value has to be accepted or assumed. It can never be definitely determined. No one, however, who has knowledge of what scientific control has done, or is capable of doing, not alone in one ramification of an industry, but indeed in practically all, can doubt that it is a distinct advantage, and that it pays handsomely. The pity is that it is not more generally applied in the control of smaller works. The gas industry long ago discussed the desirability of organising a testing and scientific control system for congeries of smaller works, but nothing seems to have eventuated. That good would result cannot be doubted. Indeed, for many of the smaller chemical works in this country, some such scheme, if feasible, would doubtless prove alike advantageous and profitable.

The Paint Research Station

THE Research Association of the British Paint, Colour, and Varnish Manufacturers has now been in existence for a year, and has definitely and firmly taken its place within the framework of the organisation of applied science. Great, however, as was the advance made merely in the fact of its formation, one more step was required to satisfy those who were eager to see the Association fully at work. That step has now been taken: the laboratories of the Association have been established, and on their inauguration this week, which is fully described elsewhere in these pages, congratulations were showered from all quarters on those who have worked so strenuously for this important development.

The great value which is attached to the industry was clearly shown in the presence of so many distinguished guests, and in the remarks that they made. Mr. F. H. Carr, in giving the laboratories the official blessing of the Society of Chemical Industry, said that the paint and allied trades had done well and wisely in realising the truth of the dictum that industries succeeded or failed according as to whether they made use of the applications of chemistry or not. Incidentally he made a plea for the more general appreciation of the work of those who labour to apply chemistry to the welfare of mankind. It was wrong, he said, to think that the industrial chemist was actuated solely by a desire to amass wealth: the man who did good work in applied science, equally with the pure scientist, must be actuated primarily by a love for his work.

Special importance was attached to the presence, at the inauguration, of Dr. E. R. Weidlein, the

director of the Mellon Institute of Industrial Research. Dr. Weidlein is the chief of an organisation which has long since shown the immense value of applied science, and those present were therefore very anxious to hear his views. He was generous in his tributes to those who had been responsible for the organisation of the Association and its laboratories. As far as industrial research was concerned, he stated his considered opinion, borne out by twenty years of experience, that as an investment it always paid for itself in dollars and cents. Research, however, had a larger value, its value in advancing humanity and in bringing about a better understanding between nations.

Dr. E. F. Armstrong made an important statement with regard to the attitude of I.C.I. towards the new laboratories. In offering the Association his best wishes, he indicated that I.C.I. takes a real interest in the paint and varnish trade. Its work, however, will be complementary to that of the Association. In the main, it will supply basic raw materials. It has particularly set itself the task of supplying the synthetic raw materials (such, for example, as cellulose products) which, already in great demand, will be more and more urgently required in the future. In the production of solvents also it will take a leading part. Climatic and other reasons militate against the production of these in Great Britain by fermentation methods, and hence (as Dr. Armstrong stated) coal will be the source from which they will be obtained. This is yet another indication of the immense importance attached by the leading industrial chemists to the utilisation of coal by the methods which are being worked out here and abroad. Finally, Dr. Armstrong suggested that the research station should make a study of the paint and varnish films required for various special purposes.

National Certificates in Chemistry

A SHORT time ago, the views of the Government inspectors on the scheme of National Certificates in Chemistry, jointly administered by the Board of Education and the Institute of Chemistry, were noticed in these columns. An opportunity now arises of regarding the matter from another point of view, the council of the Institute having, at the request of the Board's departmental committee, stated the opinion it has formed as the result of experience in administering the scheme for the issue of certificates to part-time students. In the first place, it may be observed that (as the council of the Institute remarks) the statement does not refer to the important question of the place and value of examinations as elements in training for industrial, commercial, and professional activity. As regards the joint scheme, however, it is pointed out that a number of good results have accrued. In its very inauguration, it had at once a good effect, for when certain schools submitted their syllabuses and courses for approval, the joint committee of the Board of Education and the Institute, finding them unsatisfactory, insisted on substantial improvements before giving its sanction.

In the years 1923–27, a steady improvement in the general quality of the work judged has been observed, and there can be no doubt that the introduction of the National Certificate has led to a marked improvement in the quality of the chemical teaching of part-time students in many institutions. The Institute of Chemistry is convinced that the scheme has given it the power to assist the progress of part-time chemical teaching in at least two important respects: (1) By insisting that candidates receiving national rather than local certificates shall be well grounded in the fundamental principles of chemical science; and (2) by insisting on a high standard of proficiency in laboratory work. Moreover, part-time students, as a result of the institution of the scheme, have carried their training beyond that required for National Certificates in order to prepare themselves for the Associateship of the Institute. The council of the Institute does not refrain from criticism, which mainly bears on the quite human tendency of teachers, when acting as internal examiners, to treat the weak student rather generously. This, however, is only a trifling matter. After six years of life, the joint scheme, in the opinion of the council of the Institute, "has proved the value of its examinations as an element in training for industrial life," the following objects being kept in view: The inculcation of a sound training in scientific principles and an avoidance of premature specialisation; the attainment by all successful candidates of an adequate standard of scientific knowledge; and the maintenance of a standard of proficiency in practical chemistry as tested by the performance of laboratory exercises carried out under adequate supervision. In the coming years, this scheme will certainly have an influence for good on the chemical industry of the country.

Books Received

GENERAL CHEMISTRY. By Thomas P. McCutcheon and Harry Seltz. London: Chapman and Hall. Pp. 415. 16s.

TEXTBOOKS OF PHYSICAL CHEMISTRY. Edited by Sir William Ramsay and F. G. Donnan. SPECTROSCOPY. By E. C. C. Baly. London: Longmans, Green and Co., Ltd. Pp. 532. 22s. 6d.

CITY OF SALFORD. ANNUAL REPORT OF THE CITY ANALYST FOR THE YEAR 1926. By H. H. Bagnall. Pp. 48.

KOLLOIDCHEMIE (in German).—By Richard Zsigmondy. Leipzig: Otto Spamer. Pp. 256. 16 Rm.

The Calendar

Sep. 23–26	Association of Special Libraries and Information Bureaux. Fourth Conference.	Trinity College, Cambridge.
Sept 26–Oct. 1	Eleventh Annual Exposition of Chemical Industries.	Grand Central Palace, New York, U.S.A.
Sep. 28	Faraday Society: "The Electronic Theory of Valency." T. Martin Lowry. "The Effect of Temperature on Diffusion Potentials." E. B. R. Prideaux. "The Ionisation of Polyhydrion Acids." C. Morton. "The Velocity of the Decomposition of Nitroacetic Acid in Aqueous Solution." K. J. Pedersen. 8 p.m.	Burlington House, Piccadilly, London.
Oct. 3–7	Shoe and Leather Fair.	Royal Agricultural Hall, London, N.
5	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
11	Institution of Petroleum Technologists, 5.30 p.m.	Royal Society of Arts, John Street, Adelphi, London.

An Analysis of Some Chemical Export Markets

By E. C. Warren, B.Com.

In what follows, the chemical export trade is surveyed and the question of foreign competition considered. Special interest should attach to this article, as the writer has dealt with the subject from the point of view of the economist.

CHEMICAL exports are improving. Definite signs are now apparent that the relative depression in overseas trade, experienced by the chemical industry over a number of post-war years, is receding, and that real business expansion is at hand. Since the boom period of 1919-1920 we have become accustomed to an annual export trade worth something in the neighbourhood of £20,000,000, with small fluctuations year by year away from this figure, and under the enormous difficulties in shipping work, entailed by uncertain foreign exchanges, this stability of business has been an achievement of consequence. Economic conditions in many countries are, however, much in advance of what they were even at this time last year, and, moreover, in most instances, are totally distinct from the position of six years ago, when the export trade depression was showing in its most acute form.

Better demands for chemicals are the natural result. This is shown already in the statistics of our shipments during the first half of the current year, which make a favourable comparison with those for the same period of many earlier years. The 1927 business thus recorded is slightly in excess of £10,126,000, and shows an improvement of £178,000 over that for 1926. It is true that last year's figure was reduced by strike events, but the increase is scarcely affected by changes in currency values, and the upward movement is therefore a real development.

Looking more closely at the latest figures it may be seen that the net result has been arrived at by better business in a number of directions. In the Far East, Japan has bought more ammonium sulphate, and, among Continental customers for this product, both Spain and Italy show larger purchases. Disinfectants and insecticides also record improved conditions, but the most marked increases are to be sought elsewhere.

Thus the shipments to overseas' markets of painters' colours are among the most outstanding features. Other products which stand out prominently in British statistics include compounds of potassium and also sodium. Overseas' business with the first named has this year been £22,000 larger than in 1926 and £19,000 more than in 1925, an improvement which is common to all the products under this heading. Carbonate and caustic soda have both contributed in a large degree to this better business, the total for the carbonate having reached as much as £848,000. The suggestion which devolves from these considerations is, therefore, that our export trade is taking advantage of better buying conditions abroad and is alert to the new opportunities. Much remains, however, to be done before our pre-war position, if this be accepted as a standard of comparison, is re-established fully.

South American Demand

In one great trade direction, viz., South America, an analysis on this basis certainly does reflect encouragement. All the countries of this vast continent are approaching their pre-war buying strength and coupled with this is the fact that British exporters are getting their normal share of developments as these occur. Before the war our chemical shipments to all South American countries were calculated at £1,100,000 per annum, or approximately 25 per cent. of the total volume of imports into these countries. The local statistics of these areas are not so detailed as might be desired, but a survey of the broad classifications indicates, with sufficient precision, the value of British supplies and the proportion which they bear to the whole.

Thus, domestic statistics compiled in Brazil show that our pre-war chemical shipments were equivalent to £320,000, out of total receipts into that country from all sources amounting to £1,200,000. As a comparison with this may be taken the most up-to-date figures, for a fiscal year covering 1925-26, when receipts from British manufacturers were placed at £550,000 and total imports from all sources at £1,850,000. Probably most of this apparent increase in buying is nominal, being vitiated by changes in monetary values, but even so, the strength of our position in this market is undoubted.

From Argentine statistics a nearly similar relationship of figures is to be observed. The most recent returns indicate that our business alone is worth £1,000,000 per annum, whilst Argentine requirements are well over £4,000,000. Compared with this are the pre-war supplies from Great Britain of £620,000 and the total shipments from all sources of £2,800,000. In both these countries it may be said quite roughly that the British proportion of the whole remains at one-quarter.

With Uruguay, and also Chile, the individual imports from Great Britain are £100,000 per annum, as against the £62,000 of the last pre-war year, but whilst in the case of the former country our shipments rank at nearly 30 per cent. of the whole, the latter takes only 10 per cent. of its requirements from us. For the remaining countries of the continent, chemical business is still not far advanced. Before the war the combined imports of Columbia, Peru, and Venezuela did not amount to more than £60,000, of which about half was derived from British manufacturers, and, according to the latest returns obtainable, the quantities of chemicals taken are even lower, although a satisfactory feature is the maintenance of our proportion as against competitors.

South America as a Whole

The net result for the whole of South America is that these countries now take £2,000,000 worth per annum of British chemicals. Competition is, of course, extremely keen for such valuable markets, as their progress seems at present to be entirely without limits. During the early post-war years, rivalry was particularly noticeable from U.S.A., but in more recent periods the returns indicate that Germany is ousting much of these supplies and is returning to her pre-war pre-eminence. Some of the individual features of these countries have been stressed in reports compiled by the U.S.A. Bureau of Foreign and Domestic Commerce in order to point the way to development of chemical activity on the part of our U.S. competitors.

Argentina, for example, is given attention, and the dominating position of British supplies in connection with disinfectants and insecticides is considered. The country is regarded as an immense agricultural and pastoral expanse, with a great need for such chemical products. Actually the Argentine takes as much disinfectants and insecticides from Great Britain as all our other world markets combined, and can be relied upon to purchase from 5,000 to 6,000 tons each year. From our point of view, this country is a sound market also for tartaric acid, but more could be done with oxalic and salicylic acids. Another product for which more effort should prove fruitful is heavy coal tar oil. In earlier years the British supplies did very well here, the pre-war average being 2,000 tons a year, but more recently there has been a falling off. Another instance of decline is that of painters' colours. Argentina is our second best customer for these, and in this respect is undoubtedly the most important of South American countries, the main demands being for ochre and earth colours, and, although good business is being effected, we are still some 20 per cent. below pre-war results.

Brazil

Outside the Argentine a leading possibility is the growing textile industry of Brazil, which presents the best field in the continent for dyes and dyestuffs. Practically the whole of our South American dye exports are concentrated upon this Brazilian industry, but competition from German supplies is increasingly active. An instance here of better British results is that of sodium compounds, which serve also to indicate how this country is opening up. Before the war our shipments were in the vicinity of 15,000 tons a year, a figure which has now advanced to 25,000 tons, after a steady upward trend. The main item in the group is caustic soda, of which we now not only supply double the pre-war quantity, but also more than all other rival sources combined. In other sections there is, however, scope for consideration. Demands for disinfectants and insecticides are greatly on the increase from the vast pastoral areas, so much so that our normal supplies of

250 tons are relatively small. This is true also of chemical manures, our supplies amounting year by year to only about 7 per cent. of the total import trade. Progress is being made with painters' colours and potassium nitrate, and the statistics show a fair development in business for sulphuric, boric, and acetic acids.

To sum up briefly, an outstanding feature of South American chemical business is the effort of German competitors, a fact which is amply confirmed by the results given in the German annual Statistik des Warenverkehrs. There, the shipments to South American countries loom large in relation to German exports elsewhere.

The British Dominions

Outside South America, another interesting group of markets is that of the British Dominions. Apart from Canada, with its particular orientation towards U.S.A. supplies, the first main fact which comes to light in any observation of the domestic statistics of these countries is the extremely high proportion of their requirements which are purchased from Great Britain.

A second leading point is the relatively low position which our shipments to the Dominion countries occupy in comparison with our exports elsewhere. In many directions our hold on these markets constitutes a veritable monopoly, and therefore side by side with their progressive movements should go increased British sales. Each country has, of course, its own peculiar requirements, but their relationship among themselves in regard to such a section as that of sodium compounds, for which all present demands, is interesting as indicating their individual importance. Our annual export of these compounds to India, South Africa, Australia, and New Zealand now varies between £1,600,000 and £2,000,000, and of this approximately 50 per cent. is purchased by India, another 25 per cent. by South Africa, 20 per cent. by Australia, and 5 per cent. by New Zealand.

Trade with Canada

The Canadian position as regards British chemicals is unique, and may be shown briefly by comparison with competing supplies. With acids, for instance, the average total imported from Great Britain is £24,000, according to the Dominion Bureau of Statistics, whilst the United States is a supplier of £60,000 per annum, and other competitors combine to send a total about equivalent to that of Great Britain. Approximately 22 per cent. of Canadian imports of acids are therefore derived from us. Dyeing and tanning materials also furnish a case in point, our supplies ranging round £30,000 a year, as compared with those from U.S.A. valued at close upon £400,000; whilst another £170,000 worth are being taken from other sources. Fertilisers reflect much the same position, but in paints, pigments, and varnishes the market is supplied up to 25 per cent. by British manufacturers. Nevertheless, although broad classifications appear to disparage our position in Canadian demands, several individual products illustrate a strength in British supplies. Thus, of the Canadian imports of citric acid not less than 66 per cent. is purchased from Great Britain, and this despite the efforts of numerous competitors, each of whom necessarily supplied but a fraction of our business. In the trade for anti-corrosive paints our share of the whole is 33 per cent., but our business is much more important than this at first suggests, as several competitors cover the remainder of the demands, each with small percentages, so that our position is very sound.

With the other large countries of the Empire the position in general is much more clearly defined in our favour. Competition is by no means non-existent, and in this connection the instance of chemical fertilisers imported into India may be cited. Great strides have been made of recent years in the development of Indian agriculture, accompanied by increased importation of fertilisers. British supplies are well to the fore, but German competition is now becoming increasingly active.

In Australia, a special competitive feature which is gradually advancing is the establishment of local production, under cover of the Preservation of Industries Act. Internal manufacture is proceeding more especially in connection with insecticides and animal washes, for which domestic demands are on a large scale. According to the latest Commonwealth returns, the products for which Australia continue to offer the biggest import business include tartaric acid and tartrates.

New Paint Research Laboratory

Official Inauguration

On Wednesday, the laboratories of the Research Association of the British Paint, Colour and Varnish Manufacturers, at Teddington were officially inaugurated at a luncheon held at the Clarence Hotel.

The chair was taken by Mr. S. K. Thornley, chairman of the Association, and the guests included the following, among others: Sir Joseph Petavel, F.R.S. (director of the National Physical Laboratory); Mr. H. T. Tizard, F.R.S. (secretary of the advisory council of the Department of Scientific and Industrial Research); Mr. W. J. U. Woolcock; Mr. F. H. Carr (president of the Society of Chemical Industry); Dr. J. J. Fox (of the Government Laboratory); Dr. E. F. Armstrong, F.R.S.; Lt.-Col. Sir David Prain, F.R.S.; Professor J. W. Hinchley; Professor T. M. Lowry, F.R.S.; Major C. A. Mander; Mr. C. A. Klein; Mr. J. W. Bispham (principal, Borough Polytechnic); Dr. G. Rudorf, Ph.D. (Air Ministry); Dr. E. R. Weidlein (director of the Mellon Institute of Industrial Research, U.S.A.), and Sir Robert Robertson, F.R.S.

After the loyal toast had been honoured, Mr. F. H. Carr proposed the toast of "The Research Association." The toast was seconded by Dr. E. R. Weidlein, director of the Mellon Institute of Industrial Research, United States. In the course of his speech, in which (speaking from long experience) he stressed the value of research, both financial and otherwise, he mentioned that the recent production of ethylene glycol and related substances in the United States was leading to their manufacture and production in enormous quantities. The toast was further supported by Dr. E. F. Armstrong, F.R.S., who stated that, in the unavoidable absence of Sir Harry McGowan, he represented Imperial Chemical Industries, Ltd.

Inspection of the Laboratories

Before and after the luncheon the laboratories were open to inspection by members of the Association, manufacturers of machinery and accessory products, and others interested in this and related industries. The director of research, Dr. L. A. Jordan, was appointed in November, 1926, and the building was not bought until February, 1927, but the work of adapting and equipping the building as a research laboratory has been carried out very rapidly and efficiently.

The research station consists of a two-storeyed factory-type brick building, having a floor space of approximately six thousand square feet, standing in an acre of ground, some of which will be used for exposure fences. It has been adapted so that three chemical and physical laboratories occupy the upper floor, whilst below, in addition to offices, library, etc., are rooms suitable for a technical laboratory, workshop, and semi-manufacturing scale operations. The laboratories are equipped with all the necessary apparatus for the study of the properties of any materials used in the industry, and a start has been made in the provision of small scale machinery. Several specialised pieces of plant and apparatus have been presented or loaned by firms or individuals interested in the work of the Association. Considerable emphasis is being laid upon this side of the development of the work in the laboratory. Parallel operations on a small scale will be carried out, when the various factors concerned, such as time, temperature, humidity, and the numerous other points of importance can be accurately measured and recorded.

Some exhibits dealing with the work which is being carried out were on view. Research is already in active progress on several important problems connected with the refining of linseed oil, the study of the blooming of varnishes and similar deficiencies found in varnish films, and the correlation of indoor accelerated weathering tests for durability with outside weathering tests.

After the luncheon, a very largely attended meeting of the Research Association was held. Mr. S. K. Thornley, who has hitherto acted as chairman, was elected president, and Dr. H. H. Morgan and Mr. C. F. A. Hare (of Bristol), vice-presidents. The constitution of the council remains unchanged for the time being. After the formal business had been concluded, the members of the Association listened to an address by Dr. Weidlein.

Some Chemical Engineering Exhibits at Olympia

Notes on the Shipping, Engineering and Machinery Exhibition

The Shipping, Engineering and Machinery Exhibition, which closes at Olympia to-day (Saturday), has been attended with great success. The broad outlines of the exhibition have already been dealt with, and we now give a detailed account of the exhibits which more particularly concerned the chemical and allied industries.

A NOTABLE feature of the Shipping, Machinery, and Engineering Exhibition this year was the number of displays of non-corrodible metals. Thos. Firth and Sons, Ltd., of Sheffield, exhibited a comprehensive range of products made from Firth "Staybrite" and "Stainless" steels. "Staybrite" steel has exceptional ductility combined with high corrosion-resisting qualities, resisting completely the corrosive action of atmospheric conditions, sea water, and many acids. In

FIRTH'S STAND AT THE EXHIBITION.

this connection a number of corrosion tests were on view, while the most noticeable feature of the stand was a large revolving sphere of Staybrite steel over which a stream of water constantly trickled, with no ill effect whatever. Among other exhibits were castings, welded piping for use in chemical plant, and many examples of the material used as a decorative metal or for domestic appliances. One exhibit of particular interest was a length of fine Staybrite wire, 0·00048 in. in diameter, for use in making very fine screens and filters.

The use of Monel metal was well illustrated on the stand of J. and J. Weir, Ltd. (Monel Metal Dept.), by a variety of manufactures made from this material, examples being solid drawn condenser tubes, valves, seats and spindles, filter gauze, sheet metal, and a variety of castings and stampings.

The development and production of important new alloys has long been a feature with Hadfields, Ltd., so it was not surprising to find that their exhibit included special displays of two of their most recent innovations, the "Era/C.R." and "Era/H.R." steels. Besides being com-

COLD-PRESSED "ERA" STEEL UTENSILS SHOWN BY HADFIELDS, LTD.

pletely resistant to atmospheric conditions, "Era/C.R." non-corroding steel withstands the action of water and is completely unattacked by a wide range of chemical agents, including nitric acid. It is interesting to note that as a result of many experiments it is now possible for tubes to be cold drawn in this material. As it does not depend on heat or surface treatment, the properties of "Era/C.R." steel are not altered by deliberate or accidental heating. Among the products shown were cold-pressed acid containers, tubes for corrosive liquids, and a variety of decorative wares. The heat-resisting "Era/H.R." steel exhibits remarkable non-scaling properties up to temperatures of 1,000° C., together with the retention of a great proportion of its strength, so that it would appear particularly useful for parts of furnaces where oxidising conditions in the presence of sulphurous gases are encountered.

Stainless steel for turbine blading, and in the form of sheets, bars, strips, and welded sheets, were exhibited on the stand of Brown, Bayley's Steel Works, Ltd., of Sheffield, together with other stainless steel, chiefly for marine use. On the stand of Sir G. Armstrong-Whitworth rustless iron was displayed. Prominence was given to non-ferrous tubes by the Yorkshire Copper Works, and particularly striking was the pyramid of cupro-nickel condenser tubes. The company makes a special feature of corrosion problems, and the research department maintained in this connection is at the disposal of all interested in this matter. Brass tubing made specially for sugar beet factories was also displayed. Other corrosion-resisting tubes were shown by Allen Everitt and Sons, Ltd., of Birmingham, who had a varied display of supernickel tubes. Beechcroft and Partners, Ltd., devoted part of their stand to illustrations of the scientific side of the firm's business in the direction of the analysis and the testing of metals, while another firm that made a feature of its research service was Fry's Metal Foundries, Ltd , who specialise in die castings (with special attention to aluminium) and in anti-friction metals.

Protective Coatings and Anti-corrosion Paints

Among the manufacturers of protective coatings the Mond Staffordshire Refining Co., Ltd., was well in evidence with its well-known Melanoid improved colloidal bituminous paint. Among the various grades on view were Heavy Brown (acid resisting), Furnace (heat resisting), and Heat-Detecting enamel. Among other products of the company that were shown were bituminous hot enamel, non-oxidising underwater paint and Tectal wood preservative. An interesting feature of the exhibit was the series of laboratory tests carried out to demonstrate the high resistance of these products to heat, cold, and ultra-violet rays. Brunner Mond's P.84 silicate of soda for hardening and waterproofing cement was also exhibited.

An interesting paint for protection against weather conditions was the steel paint made by Arthur Ross, Hotchkiss and Co., Ltd., who are marketing this product, prepared from waste filings from steel grinding, with the slogan "paint steel with steel paint." It is suitable for metal, brick, and woodwork, both as a priming and finishing coat, in cases in which decorated effects are not aimed at. It is said to be superior to iron oxide paint, and as it is not poisonous it is not liable to regulations restricting its use.

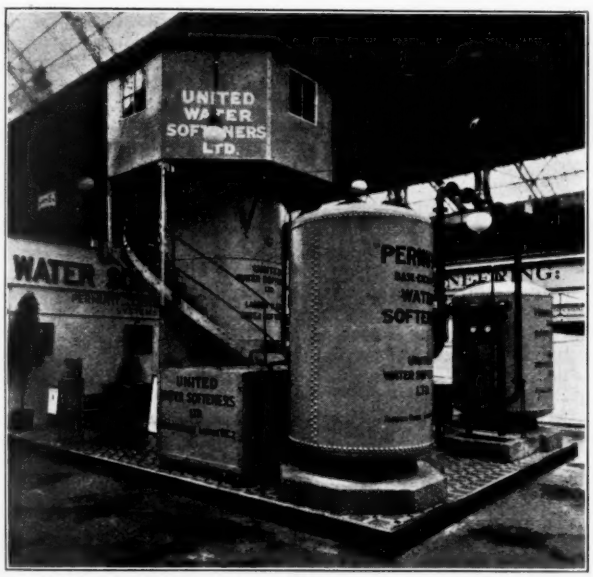
Wailes Dove Bitumastic, Ltd., showed several anti-corrosion preparations, including Bitumastic solutions (black and coloured) and Bitumastic enamel covering. Demonstrations of the corrosion-resisting powers of the products were given throughout the period of exhibition.

"Subox," a permanent lead coating composed of a pigment of suboxide of lead in colloidal form, suspended in linseed oil, was the contribution to corrosion resistants of the Electro Chemical Paint Co., Ltd., who recently put this product on the market. It is not so much a paint as a homogeneous lead covering which can be applied with an ordinary brush. It is claimed to give absolutely sealed and permanent protection against rust, chemicals, or weathering. Another preparation marketed by the company is "Collodex," a colloidal boiler scale preventive and remover. An anti-rust paint for the first coat on iron and steel was shown by Thos. Parsons

and Sons, as well as a number of paints and varnishes, and "Nitro Valspar," a spraying cellulose finish, was to be seen on the exhibit of the Valentine Varnish Co., Ltd., who are commencing to manufacture this finish at their works at West Drayton. Details and samples of Berry's bituminous paint were obtainable at the stand of Berry, Wiggins and Co., Ltd.

Water Softeners and Plant

Working installations of "Permutit" base exchange water softeners for use in the chemical, textile, iron and steel, and general industries, as well as for hotels, institutions and private houses, were on view at the stand of United Water Softeners, Ltd. This system may well be considered a triumph of scientific achievement in water softening, inasmuch as it entirely dispenses with moving parts, any water being automatically softened to zero hardness by simple passage through a bed of "Permutit" resting in a suitable container. No reagent other than a solution of common salt is necessary in the operation of the plant, while the space occupied and the attention required are alike extremely small in relation to



THE STAND OF UNITED WATER SOFTENERS, LTD.

output. Water softened by the "Permutit" process is stated to be invariably of zero hardness and incapable of forming scale in boilers, or of wasting soap or colouring materials in textile processes. The Lassen-Hjort Lime-Soda Continuous-Automatic Water Softener was also exhibited under working conditions. This well-known plant, which is installed throughout the world by large steam users in every industry for softening boiler feed water, has been improved and simplified so that the latest type ensures perfect measurement and proportioning of chemicals, with efficient filtration, and produces a water ideal for boiler feeding purposes, the hardness being brought down to as low as 1° Clark with low residual alkalinity, while at the same time the total solids are reduced to the minimum. United Water Softeners' other plant for the purification and sterilisation of public water supplies, embracing up-to-date filtration and chlorinating equipment, was also fully demonstrated, and expert advice was available on all water purification, for industrial and domestic purposes.

Fire Extinguishers

Several types of fire extinguishers were on view, some portable and some permanent. Antifyre (Sales), Ltd., exhibited their "Antifyre Pistole" extinguisher, an apparatus containing no liquids whatever, and giving off no gas, working with a fine cloud of powder. It is noteworthy in that it can be recharged in a couple of seconds on the scene of fire. Other exhibits of the company comprised the latest type of foam extinguishers and S.A. machines.

Some of the latest types of continuous foam generators were to be seen at the stand of Simonis, Ltd., whose foam extinguishers require a pressure of about 45 lb. per square inch.

Yet another type of extinguisher employing carbon dioxide was shown by Walter Kidde and Co., Inc., whose exhibit consisted of apparatus for the detection and extinction of fire, especially as applied to marine requirements. A Lux-Rich system for protecting cargo holds was shown, consisting of the Rich smoke detecting cabinet, used in combination with a Lux extinguishing system, which consists of cylinders containing carbon dioxide, which can be liberated through the same pipe lines that are used for smoke detection. The carbon dioxide rapidly builds up an inert atmosphere in the hold in which fire has occurred.

Spraying Equipment

All kinds of spraying equipment were on view at the stand of Attwood's Spraying Equipment, Ltd., including pistol sprayers, air compressors, air receivers, and clarifiers. Samples of work done were also to be seen. Another firm specialising in spraying equipment was the "Four Oaks" Spraying Machine Co., who exhibited a collection of their limewashing and disinfecting machines, some models of which can be used as fire extinguishers. Demonstrations of spraying were given by Aerostyle, Ltd.

Control Instruments

Many stands were devoted to the products of the firms of instrument makers, most of whom were exhibiting control apparatus. Of particular interest among the exhibits of the Electroflo Meters Co., Ltd., was the new motor-driven combined CO_2 indicator and recorder and exit flue gas temperature recorder. This instrument is free from fragile materials, and is of rugged construction. Its outstanding feature is that it retains the fundamental accuracy of measurement by chemical analysis, and is entirely free from water. It is provided with clearly visible indicating scale with separate pointer calibrated from 0 to 20 per cent. CO_2, and flat circular chart on which a continuous line record of CO_2 content is made, visible from the commencement of operations. Entirely new devices shown for the first time at the exhibition were "Electroflo" boiler efficiency meters and turbine efficiency meters. These comprise three-zone six-record recorders, taking the place of the former 12 in. circular chart type recorders. These new type recording meters automatically make six records in correct juxtaposition. For example, with the boiler efficiency meter the six records being, water fed to boiler, steam flow from boiler, percentage CO_2 in exit gas, exit flue gas temperature, steam temperature, and steam pressure, so that the complete story of boiler operation is presented on a 12 in. wide continuous strip chart.

The Foster Instrument Co. were showing a wide range of pyrometers, distance thermometers, and recorders. The Multiple Record "Strip" Recorder, which makes several distinguishable records on one chart of normal width, attracted considerable attention, while another feature of the exhibit was the system of automatic control of high temperatures, shown in conjunction with a lamp signalling system. When the thermo-couple in the apparatus fails, the fact is instantly signalled audibly, thus preventing overheating. This apparatus was shown working. Pyrometers and other instruments incorporating the "Resilia" system were shown in operation, subjected to rolling and vibration. Another exhibit of interest was the "Fixed Focus" radiation pyrometer used for direct automatic measurement or recording of high temperatures, without preliminary adjustment by the user. Thermo-couple pyrometers, both "rare-metal" and "base metal" types, were shown, for all industrial applications, with indicators for portable or fixed use, and with autographic recorders, all incorporating "Resilia" moving systems. Other instruments included expansion thermometers and metal cased mercury thermometers.

Electrical CO_2 and CO indicators and recorders, apparatus for recording the percentage of dissolved oxygen in boiler feed water, draught and pressure gauges, temperature measuring instruments and automatic temperature regulators were among the instruments shown, many in operation, by the Cambridge Instrument Co., Ltd. The well-known industrial and power plant instruments of the Brown Instrument Co.,

Philadelphia, were shown by the Lovick Johnson Co., and included pyrometers, CO_2 meters, automatic temperature controllers. The new Brown Electric Flow Meter, operating on a new principle as applied to meters, the self-balancing inductance bridge, were shown in several models. Boiler feed water recorders were in evidence in the display of the Lea Recorder Co., who were showing meters and recorders of several types for use in connection with water or coal supply. There was a big display of "Sarco" fuel economy instruments and industrial control apparatus on the stand of the Sarco Co., Ltd., the pioneers in this country of automatic combustion recording. The firm of James Gordon and Co., Ltd., have secured the patent rights for the British Empire and the Continent for the Hagan system of automatic boiler control and had on view a working exhibit of the system. Other firms specialising in indicating and recording instruments who exhibited were Walker, Crosweller and Co., who showed their Arkon, Foxboro and Ellison instruments, and the Bowen Instrument Co., who had on display resistance, radiation, thermo-electric, and other types of pyrometers.

An actual demonstration of glass thermometer manufacture by one of the firm's own skilled glass blowers, showing the method of making thermometers, including blowing the bulb, filling thermometer with mercury or spirit, and calibrating the finished article, was seen on the stand of Negretti and Zambra. Various types of dial type thermometers for different uses, draught gauges, and recording thermometers were exhibited, as well as a pyrometer for Diesel exhaust temperatures.

Liquid Gases

An interesting exhibit, on the stand of the British Oxygen Co., Ltd., was a sectioned portion of a liquid air rectification column showing the "foam plate" construction, recently introduced by the company, which has rendered possible a high degree of oxygen purity, exceeding 99 per cent. All oxygen plants for their own and their clients' requirements both at home and abroad are manufactured by the company at their Edmonton engineering works, as well as plants for the production of nitrogen, argon, carbon dioxide, nitrous oxide, and other gases. Specimens of high pressure gas compressors and plant appliances were also on view on the stand. Many types of welding blowpipes were shown, including one which was demonstrated to cut metal under water. Automatic regulators, all kinds of high pressure gas valves for cylinders and gas mains, and a small air liquefying plant were among the exhibits. Another firm displaysing oxygen plant was Liquid Air Ltd., who illustrated their method of extracting oxygen from the air. The stages through which the air passes that were illustrated were purification, compression, separation of oil, drying, liquefaction, and finally, rectification and packing the gas in cylinders. Oxyacetylene cutting and welding equipments and acetylene generators were also exhibited. Allen Liversidge exhibited a full range of acetylene welding equipment and dissolved acetylene plants.

Gas Protection Apparatus

Siebe, Gorman and Co., Ltd., had an interesting display of gas masks for short and long periods of duty. The most universally applicable, perhaps, was the "Purether" self-contained mask, which, simply by changing the absorbent, can be used as a protector against any known gas. Among other masks of interest was the half-hour mask with self-contained oxygen container, which was said to be particularly useful when working in a carbon monoxide atmosphere. The one-hour self-contained was also shown, and the two-hour self-contained mask was demonstrated in a smoke cabinet. In addition to the self-contained masks was another type to which the oxygen was fed through tubes by a pump.

Pumps

Examples of their positive displacement rotary pumps (Feuerheerd patent) were exhibited by Stothert and Pitt, Ltd., and A. G. Mumford, Ltd., showed many types of "Simplex" and "Duplex" pumps for use with air, oil fuel and various liquids. A series of "Boreas" rotary pumps, made either in gunmetal or cast iron, were on view at the exhibit of Lacey-Hulbert and Co., Ltd., while Hele-Shaw Beacham variable stroke pumps and transmission gears were a feature of the stand of Greenwood and Batley, Ltd.

The British Quadruplex Co.'s exhibit consisted of various types of rotary valveless pumps. The Quadruplex pump was also shown as an air compressor, with adaptations for use in decanting liquids, in which case no liquids actually pass through the pump. The same system is also used for sulphuric acid and other liquids. A type for pumping viscose in artificial silk manufacture, giving constant and controlled delivery, was also exhibited.

Filter Compressors and Separators

"Rovac" Rotary Filters, which were exhibited by the British Rotary Filter Co., Ltd., have been specially designed for the automatic and continuous separation of solids and liquids from sludges or slurries of all descriptions, such as coal, mineral ores, china clay, caustic, paper pulp, chalk, lime, starch, and chemical slurries, etc. The filters are normally constructed in cast iron, but are also made of special acid or alkali-resisting metals, if desired. The special advantages as compared with filtering processes hitherto used, which necessitate constant and careful attendance, are low power consumption and operating expenses, continuous working, effective washing of the solids, the separation of the mother and wash liquors, intensive drying, large output, and great saving of filter cloths, wages, time, and maintenance. Auto-Klean Strainers, Ltd., are the manufacturers of a gauzeless, self-cleaning system of straining for oil, water, and other liquids, and their exhibits included a sectional model showing details of construction, together with samples of components used in its manufacture.

The Rapid Magnetting Machine Co., Ltd., exhibited various types of electro-magnetic separators, for handling various materials such as coal, foundry sand, metal turnings, swarfe, etc., all of which were demonstrated. This firm's patent separators as used in steelworks, powdered fuel installations, foundries, and the like, were connected up for test purposes during the Exhibition.

The Stream-Line Filter Co., Ltd., again showed their commercial filters, based on the patented principle of edge filtration, and their oil separator for bilge and ballast water and for boiler feed. Self-contained renovators for the recovery and purification of used lubricating oil, and for renewing broken-down transformer and switch oils, were shown in several sizes. Rotary air compressors and vacuum pumps for all purposes were to be found on the stand of Bernard Holland and Co., who showed several types, including the Holland/S.L.M. system two-stage rotary air compressor, a semi-portable two-stage compressor, a small Holland/S.L.M. plant, and various types of manual compressors.

Boiler Accessories

At the exhibit of Babcock and Wilcox, Ltd., the principal feature was the presentation of a four-reel film illustrating the manufacture of the Babcock boiler. In the first reel the working of the boiler depicting the path of the furnace gases through the tubes, the path taken by the water in the boiler, and the method of steaming was cleverly indicated. The second reel showed the complete manufacture of a boiler drum, and the third reel showed the flanging of the superheater pipes and other details of manufacture, while the fourth reel recorded the building up of complete boiler sections and the final assembly. Exhibits on the stand included examples of the Victory wrought steel valve, which has been designed to deal with high-pressure steam. A feature of this is the small number of loose parts and the use of a particularly hard alloy for the seating. Cast steel valves were also shown. An interesting new boiler that has been developed for use with oil fuel was illustrated by means of a model, the Babcock and Wilcox Illuminating Water Gauge Fitting, in which the level of boiler water is shown by the position of a bright spot of light.

Bolton's Superheater and Pipe Works, Ltd., were exhibiting the Bolton-Gray patent high superheat, high pressure, sectional superheater for all types of cylindrical and water-tube boilers. An interesting and efficient apparatus for the prevention of the escape of hot gases from, and the leakage of cold air into, the down-take flue of Lancashire and similar boilers was seen in Gray's Patent Expansion Downtake, which is said, besides sealing the downtake, to reduce the amount of black smoke.

The " Thermofeed " feed water regulator, which maintains a constant water level, thus increasing the efficiency of boilers, was shown by Ronald Trist and Co., Ltd. This appliance works in conjunction with an automatic regulating valve, and as soon as the desired level has been attained the pump is automatically stopped.

The " Hilo " water alarm, which warns the attendant when the water level becomes dangerously high or dangerously low in the boiler, was also exhibited, as was the " Guardian " safety device, an apparatus fitted to oil-fired boilers, which automatically shuts down the fuel supply valve in case the pumps should fail. This firm's well-known " Sea Ring " packings and jointings, suitable for steam, water, oil, ammonia, acids, etc., were also shown.

Asbestos Products and Packing Rings

The Beldam Asbestos Co. displayed a comprehensive line of manufactured asbestos goods. Conspicuous among exhibits of that material was the stand of the Cape Asbestos Co., who cater on a large scale not only for the various requirements of the engineering trade but also for the numerous articles that the chemical trades require in asbestos. They also make a speciality of asbestos lagging. The François Cementation Co. showed asbestos cement pipes in a large range of sizes. It was evident that they are light and strong, easily laid and quickly jointed, and in some circumstances it is probable that they will be found preferable to cast iron, especially having regard to the fact that they are stated to be lower in price and are immune from encrustation and deterioration through the action of acid or sewer gas.

The Flexo asbestos furnace cement of Thomas and Bishop is said neither to shrink, crack, nor become porous upon exposure to great heat. It fuses, in fact, into an ivory coloured glaze, which unites with the surface it covers, and is said to protect it completely and permanently from heat. Temperatures, indeed, which fire-clay cement cannot stand for long have, it is stated, no effect upon this cement.

Cleaning Machinery and the Recovery of Grease

As a rule machinery does not get on well without oil, but when once they have got there oil and grease cling to it tenaciously. Crawshaw's Chemical Colander, the proprietors of whose enterprise are the Castner-Kellner Alkali Co., were exhibiting what appeared to be a convenient and effective means of saving the time and trouble that this circumstance causes in works. The apparatus is, in effect, a vessel in which greasy things can be put in order to be steeped in the vapour of a liquid called Crawshawpol, after a few minutes of which they will be perfectly clean. When the heat that caused the liquid to evaporate is turned off, the vapour condenses. The articles, in fact, have had a shower-bath, which has dissolved and washed away the grease, and the arrangement of the inside of the colander is such that the oil or grease clears away from the work into another part of the vessel, and leaves the articles perfectly clean. Crawshawpol boils at a considerably lower temperature than water, and is not inflammable or in any way objectionable. It will last for a long time with steady work, is heavier than water and does not mix with it, and can partly be recovered when it has been used.

In the exhibit of Industrial Waste Eliminators, Ltd., visitors saw a complete plant for de-oiling, washing, and drying cotton waste, rags, and similar materials. A model was also shown of a complete patent dry-process plant, now building, in which the melting and rendering of fat from every waste known to the butcher, the crushing and reducing of bones, the making of meal and fertilisers, and all the other operations necessary to get the most out of the material at disposal, are carried on with an entire absence of nuisance.

Miscellaneous

Ogilvy and Co. had for their chief exhibit the Leitz Micrometallograph, which has recently been redesigned, and is claimed to be the most efficient instrument for both visual observations and photo-micrography of metal surfaces. Other interesting exhibits were the new Oil Immersion Objectives for metallurgy and a variety of microscopes, and microscopical accessory apparatus, including vertical illuminators, micrometers, setting stages, etc., and microscopical illuminating apparatus for both visual observations and photo-micrography. The National Time Recorder Co., Ltd., were exhibiting their well-known Time Recorder products. The machines exhibited were suited to such purposes as timekeeping and costing.

An interesting stand was that of " B. and L." Powdered Fuel System, where information was obtainable about the Brand methods of utilising pulverised " L. and N." fuel for marine and land boilers. The apparatus was on view with which Brand demonstrated the exceedingly high flash point of " L. and N." fuel when pulverised, but, owing to the difficulty of making this dust tight, no demonstrations were given.

Dyestuff Production in Japan

A REPORT on Japan's dyestuff output was made recently by a local association to the Japanese delegates for the Economic Conference at Geneva. The report gives a panoramic view of the present condition of Japan's dyestuff industry and the protective policy of the government, with particular reference to the high customs wall and liberal subsidisation. Up to the outbreak of the Great War, the report says, the world's dyes (referring mostly to coal tar and synthetic dyes) were monopolised by Germany. " The dyestuff industry of Japan was established during the war. Before it was perfected, the industry met with serious setback, due to the change of the after-war financial situation and the return of cheap foreign imports. Although the industry went through a severe ordeal it now prospers. The present annual production reaches more than 10,000 kin, and there are scores of products which rival foreign dyes in quantity and cost of production. Japan is now able to supply about one-half of her entire demand. Foreign merchants import dyes that cannot be manufactured there and sell at high prices, while duplicates of dyes made in Japan are imported at cut prices. These facts seriously interfere with the development of the industry."

Sulphur colours, which are largely in demand, are produced in Japan. The Japan Dyestuff Manufacturing Co., Ltd., generally known as Nissen, is the largest producer.

" High-class green and purple colours are not yet made in Japan, but all other kinds of acid colours are produced with satisfactory results. Diamond Black, the most important of acid-mordant colours, is produced in the country, giving the finishing touches to the manufacture of this kind of colours. Nearly all important basic colours are now completely produced in Japan. Methylene Violet is exported. Alizarine colour has been made since olden time, but its development is hampered as the use of colours other than blue is limited. Japan has succeeded in making superior kind of alizarine blue. Except artificial indigo, vat colour manufacture is not satisfactory compared with American or European colours. The fact that the demand is small is the cause for slow development of this high-class dyestuff."

Barium Dioxide and the Flexible Tariff

THE question of the validity of the United States flexible tariff provisions is before the Supreme Court of the U.S. The case that presents this question is that of J. W. Hampton, Jr., and Co., Petitioner, v. The United States, now before the Court on petition for writ of certiorari to the United States Court of Customs Appeals. According to the brief for the petitions, this case raises the constitutionality of Section 315 of the Tariff Act of September 21, 1922. This is the so-called flexible-tariff provision. There is a monetary interest involved to recover duties paid to a collector of customs, who assessed by virtue of the proclamation of the President, which raised the statutory rate of four cents a pound on barium dioxide to six cents a pound. Protest and appeal were made and the case came on for trial before the Board of United States General Appraisers, now the United States Customs Court. A majority held the act constitutional. Thereafter, on appeal to the United States Court of Customs Appeals, the lower court was affirmed. It was held that Congress, in granting to the President the power to increase the rates of duty involved in this case, by adding the differences in cost of production ascertained by him under Section 315, acted within constitutional limits. The petitioner challenges the constitutionality of the so-called flexible provisions of the law as taxation by executive fiat.

Valves for Use with Acids

A Discussion of their Construction and Application

(From a Correspondent)

The engineer responsible for the installation of manufacturing processes and plant abroad must be faced at times with special problems, in connection with pipe lines, etc., which are required to withstand the corrosive action of acids; and it may be appropriate in this export issue, to deal with this matter.

In dealing with valves for steam, water, or gas, one has usually a selection of well-known types as a guide from which to make a decision; indeed, the variations of design of these valves are legion, varying from the simplest to the most complicated mechanical contrivances for stopping, increasing, and regulating the flow through pipes. Immediately, however, the engineer is faced with the all-powerful ogre of corrosive liquid, his choice of valves and pipe line accessories is narrowed down to greatly restricted limits. It is surprising to what a large extent small details are responsible for the success of many large and important installations, and chemical plant installations are certainly no exception to this rule. It is the small things that count.

The construction and lay-out of large pieces of plant, large and important process methods, methods and systems of manufacture, are frequently discussed, but the minor details must also engage attention of the chemical engineer, lest the construction of greater magnitude be nullified owing to the unsuitability or inadequacy of accessory details.

Any installation involving the use of acids will be liable to give trouble unless the question of suitable valves for tanks, vessels, and pipe lines has been carefully studied, and details of reliable construction carefully investigated. It has already been indicated that there is an immense variety of valves on the market for ordinary pipe connections, these being mechanical contrivances of a more or less complicated order. Indeed, valves for steam, gas, or water will admit of a certain amount of complex mechanical construction; but for dealing with acids, corrosive or dangerous liquids or explosives, mechanical complexity has usually to give place to the production of fittings and accessories of simplified design, and of safe and solid construction.

In regard to regulus metal valves for acids such as sulphuric, sulphurous, and mixed acids, or acid liquors, a safe and reliable type of construction is the non-rotative type of valve as shown in Fig. 1.

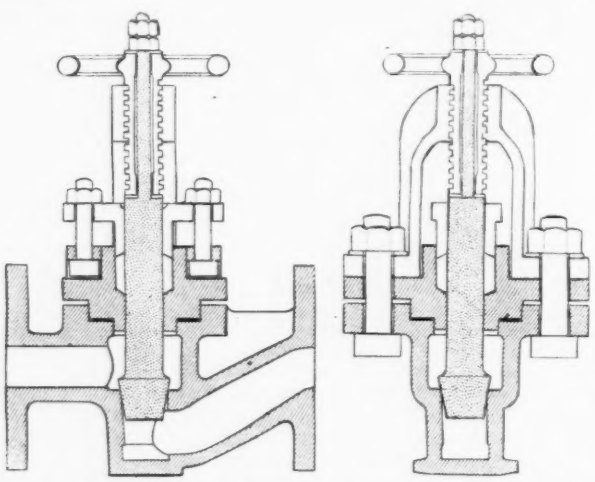


Fig. 1.—Two Sectional Views of a Non-Rotative Valve.

The winged valve here gives place to a simple form of taper plug valve, having a direct lift without any rotative action. There is a sound underlying principle governing the standardisation of this non-rotative type of acid valve.

It is well known that the resistance of metals to acid corrosion is largely aided by the protective corrosion film produced by the first contact of acid upon the surface of the metal. This surface film should be preserved intact, as it is by its existence that any further corrosion or disintegration of the metal itself is prevented. It therefore follows that mechanical friction, abrasion, or rubbing contact must be avoided as far as possible in the working parts of valves which resist acids; hence it is that valves of the gate type or sluice valves are not advocated, as these are subject to a continual rubbing action which takes place upon the seating and the most vulnerable part of the valve.

Regulus non-rotative acid valves constructed on the system described above are shown in Figs. 2 and 3.

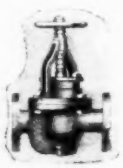


Fig. 2—Stop Valve.

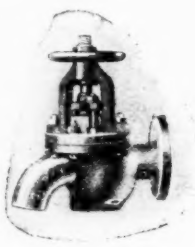


Fig. 3.—Bib Valve.

Figs. 2 and 3 show the valves as adapted for pipe lines or for drawing off and filling acid tanks. They are all constructed on the non-rotative principle for sulphuric acid and liquors containing the same, and are also used for sulphurous gases. The taper plug is raised and lowered off and on this seating by means of an outside square thread screw, working through a crosshead. In this way no other metal than regulus comes into contact with the acid or corrosive liquor. The valve stem does not revolve and the seating suffers only a minimum of surface disturbance. No screw threads enter the interior part of the valve body.

A particularly robust construction is necessarily an essential quality in the design of valves for acids, as the possibility of leakage or fracture must be carefully guarded against when dealing with dangerous acids and corrosive liquids.

Fig. 4.—Jug Valve or Acid Egg Valve.

Fig. 4 shows a valve constructed on the same principle when adapted to what is known by acid manufacturers as a "jug valve" or angle valve, this type being also largely used for inlet and outlet valves in connection with acid eggs. These valves are often arranged to be operated by remote control either by extended rods and handwheel or by chains and chain wheel for positions where the valves are inaccessible. These non-rotative regulus valves have been on the market for some considerable time, and are well known and appreciated by acid manufacturers and acid users.

Many and varied have been the suggestions brought forward from time to time for modifying the construction of acid valves, yet the type described above seems to have long held the field, both in this country and throughout Europe, as well as in America. It will readily be understood that acid manufacturers are wary of putting into use any design of pipe fitting which embraces mechanical complications, simplicity of design being usually recognised as a necessity. The primary object of pipe line accessories for acid is that they should resist corrosion; secondly they should be fool-proof, and, as far as possible, free from danger through leakage.

The Use of Silica Gel for Drying Blast

An Interesting and Important Application

At the autumn meeting of the Iron and Steel Institute, held at Glasgow during the week, Mr. E. H. Lewis, general manager of the Glasgow Iron and Steel Co., Ltd., of Wishaw, read a paper on "The Use of Silica Gel for Drying Blast." In view of the great interest attaching to this use of the gel, the more important points in Mr. Lewis's paper are indicated below.

THE varying amount of moisture in the atmosphere and its effect on blast-furnace practice has, for a long time, been of interest to ironmasters. It is 128 years since the first essay read to the "Friendly Association of Ironmasters" by the first president, Mr. Joseph Dawson, dealt with this subject. Similarly, at the inaugural meeting of this Institute, the Duke of Devonshire referred to the question as one of importance. No complete records over a long period of the moisture at Wishaw have been taken. Figures, however, taken in the West of Scotland confirm the relative variations, although in the Scottish climate the maximum moisture does not reach so high a point as that observed by Gayley. Half-hourly readings at Wishaw taken from the middle of April show the following maxima and minima :—

1927.	Maxima.	Minima.
	Grains per cu. ft. of Atmosphere.	
April	4·70	1·11
May	5·88	1·47
June	5·57	1·33
July	6·51	3·62

The importance of these figures will be realised more readily if it is borne in mind that each 0·5 grain per cu. ft. in the blast represents about 10 lb. of water per ton of pig iron made. In order to trace the result of monthly variations on the output of pig iron, some figures were taken out, and showed in the case of one furnace 1·5 per cent., and in the case of another furnace 3·0 per cent., difference between the four summer and the four winter months. As a further test the average ratio $\frac{\text{ore}}{\text{coal}}$ was calculated for ten pre-war years for all the furnaces in blast, and is reported in Table I :—

TABLE I.

	Ore/Coal Ratio.		Grains per cu. ft.	
December	1·0538		2·6	
January	1·0451	1·0448	2·6	2·6
February	1·0356		2·6	
March	1·0428		2·5	
April	1·0213	1·0301	3·0	3·3
May	1·0390		3·7	
June	1·0255		4·2	
July	0·9955	1·0138	4·8	4·5
August	1·0109		4·9	
September ..	1·0233		4·2	
October	1·0390	1·0289	3·6	3·3
November ..	1·0188		2·9	

In Scottish practice the weight of air used per ton of pig iron is about 10 cwt. more than the total weight of all other materials charged into the furnace. So that if much care is taken in selecting, sizing, and conditioning the other materials, it seems only logical to get the air also into the best possible state. Again, there are so many variable factors in blast-furnace operation, that it is desirable, if possible, to pin down one of the variables. The desirability of constant blast moisture is generally agreed, if such a result can be procured at a reasonable initial and running cost.

Other Methods of Drying Attempted

Many attempts have been made, and processes suggested, to obtain such a constant blast, either by freezing or by absorption of the moisture chemically with calcium chloride, sulphuric acid, etc. There has been much discussion concerning the merits of these processes, and the criticisms can be summarised under three heads :—

(1) That the absorption methods have proved impracticable.

(2) That freezing is too expensive in maintenance and running costs in comparison with the results obtained.

(3) That in all cases the money spent would have been better spent in improving other conditions, such as increasing the blast temperature.

At Wishaw the blast temperature is from 1,450° to 1,500° F. (788° to 816° C.), and it is not possible to raise it without danger to the refractories in the stoves. Although the possible savings from the use of dry blast are not so great at such a blast temperature, it still seemed possible to improve the efficiency of the furnaces if dry blast could be obtained at a moderate cost.

A few years ago the use of silica gel was suggested. This material, which is now made in large quantities and of uniform quality, has remarkable powers of adsorbing water. Its properties were described by Mr. E. B. Miller before the American Institute of Chemical Engineers, in Montreal, on June 28, 1920. The main features from the blast furnace point of view are that at atmospheric temperature it can adsorb up to at least 20 per cent. of its weight of water from the air with an efficiency of 99/100 per cent., and that by raising the temperature this water can be driven off, leaving the reactivated gel ready for another cycle. It is not advisable to reduce the water content below about 5 per cent. In practice it is desirable to have about 2 lb. of gel for each cubic foot of air to be treated per minute. A plant to treat 35,000 cu. ft. per minute has been erected at the Wishaw Works of the Glasgow Iron and Steel Co., Ltd., and has been in operation since April 13 of this year.

The Silica Gel Method

The plant contains six adsorber units. Each unit consists of a large steel box, in which are placed trays containing the gel in granular form. The bottoms of the trays are perforated, and the latter are so arranged in the box that the air passes through them in parallel. At one end of each box are valves communicating with the atmosphere or with the activating gases. At the other end are similar valves which allow either the air to pass to the blower, or the gases and water vapour to pass to a small exhaust fan which is used for activating. Five units are normally used for adsorption while the other one is being activated. At the atmospheric inlet "Visco" filters are placed to remove the dust which is always found in the atmosphere of an industrial district, and which would, if pulled into the gel beds, tend to clog them and increase the suction (1½ in. to 2 in. water-gauge) necessary to draw the air through.

The heat for activation is provided by the combustion of blast-furnace gas, which has been cleaned in the process of recovering the by-products from the raw coal used in the furnaces. The gas is burnt in a small combustion chamber, and an excess of air is admitted to reduce the activating gases to about 640° F. (338° C.). All the air used for combustion and dilution is also passed through "Visco" filters. The normal period for the activation of one unit is about 1½ hour. During the latter part of this time the gas is turned off and air only is drawn through to cool down the gel and bring it to an efficient condition for adsorption. The valves at the two ends of the boxes are coupled together so that the "reversing" of a unit is done in a single operation. The gas is of about 135 B.Th.U. per cu. ft., and the amount required represents the equivalent of about 7 tons of coal per day. Between the dehydrating plant and the blower there is an adjustable inlet for atmospheric air, which is used for diluting the dried air up to the moisture figure aimed at. If this were not used it would be difficult to maintain a constant moisture.

Results

It is not easy to give absolutely definite results of the use of dry blast under Scottish conditions. With a number of small furnaces blown at constant pressure from a common main, and making different qualities of iron, many other variables come into the picture. Then again the true blast-furnace gas is so diluted with the "coke-oven" gas formed in the upper part of the furnace that the effect on the CO/CO_2 ratio is difficult to observe. In 1925 the Wishaw Works produced the largest amount of iron recorded in their history, and the fuel consumption was the lowest for many years. It is the latest unbroken year, so that in Table II it has been taken as a standard. In May, June, and July of this year (1927) the dehydrating plant has been in continuous operation,

although, being the first of its kind ever built, it is still in the stage of minor adjustments which is common to all new plant.

TABLE II.

	1925.	May, 1927.	June, 1927.	July, 1927.
Moisture in atmosphere. Grains per cu. ft.	3·5	3·08	3·41	4·85
Moisture in blast. Grains per cu. ft.	3·5	1·09	1·20	1·61
Output per furnace per week. Tons	356·5	418·5	400·0	417·6
Percentage increase in output	—	17·39	12·20	17·14
Total carbon per ton of iron. Lb.	2055	1961	1938	1956
Percentage saving in fuel	—	4·57	5·69	4·82
Carbon burnt at tuyeres per ton of iron. Lb.	1705	1611	1588	1606
Percentage saving in fuel burnt at tuyeres	—	5·51	6·86	5·81
Balance of available hearth heat per lb. of carbon burnt at tuyeres (according to Johnson). B.Th.U.	1585	1724	1717	1694
Theoretical saving in carbon burnt at tuyeres (according to Johnson). Per cent.	—	8·06	7·69	6·43

The above figures require some explanation. As regards output, since 1925 some slight changes have been made in the lines of three out of the five furnaces now in blast. An analysis of the individual furnace returns shows that not less than 7½ per cent. of the increase is apparently due to drier blast.

A point in favour of constant moisture in the blast is the more regular quality of iron produced. This is the experience at Wishaw, but cannot easily be put into figures. The fuel saving, in the case of furnaces on special hematite, must give a small but important reduction in the total phosphorus and sulphur charged into the furnace.

Running Costs

The costs of running such a plant are small. The only moving parts are the hand-operated valves and the motor-driven activating fan, which takes 20 h.p. The maintenance costs should also be low. The financial saving requires to be worked out for each individual case according to local conditions. The amount of fuel saved will depend largely on the blast temperature and the average moisture in the atmosphere, its value on the cost of fuel and the cost of limestone required to flux the ash in the fuel. The further saving in cost per ton will depend on many factors, such as the proportion of the wages cost which represents time wages as distinct from tonnage, the overhead charges, etc. In Scotland if the increase in output exceeds the saving in fuel and there is consequently a bigger coal consumption, overhead charges per ton in the by-product plant will also be reduced, and the net cost of coal will be less.

There does not appear to be any loss of tar with the changed conditions. On the other hand, there is a slight diminution in ammonia recovery, which may be due to the smaller amount of hydrogen in the gases, or may be due to the increased difficulty of cooling the gas, with a bigger coal consumption. The saving will not be quite so attractive to those who need their blast-furnaces to act also as gas-producers. Taking everything into account the plant at Wishaw, so far, shows a substantial return on the capital cost.

An interesting question arises as to what is the best degree of dryness in the blast. It seems to be generally agreed that improved furnace operation follows with increased dehydration down to 1 grain per cu. ft. On the other hand, it is known that certain reactions in the furnace are slowed down when the gas is below "calcium chloride" dryness, which represents about 0·1 grain per cu. ft. What happens in between does not seem to be known. Silica gel offers an opportunity of exploring the unknown field between 0·1 and 1·0 grain per cu. ft., and it is hoped at Wishaw at a later date to venture into this region. For controlling such a hehydrating plant hygrometry becomes important. So far, the readings have been taken with wet and dry bulb thermometers, care being taken to provide sufficient draught and to keep the wick continuously wet with clean water. A recording hygrometer which would give direct readings in grains per cu. ft. would be a great advantage.

Detailed Description of the Plant

The details of the plant given in Mr. Lewis's paper may be amplified as follows: This dehydrating apparatus is designed for dealing with 35,000 cu. ft. of free air per minute and removing 4·5 grains of moisture per cu. ft. from free air containing a maximum of 6·0 grains of moisture per cu. ft. It will thus supply constantly a blast containing not more than 1·5 grains of moisture per cu. ft. The maximum conditions mentioned

A SIDE VIEW OF THE PLANT.

above only occur, of course, during certain periods of the summer months, and during the greater part of the year the dried air from the silica gel plant will show an average moisture content of considerably less than 1 grain per cu. ft., as recorded at the Wishaw installation.

The plant consists of a battery of six adsorber elements placed side by side, and arranged so that the gel in any one element can be activated while the gel in the other five is adsorbing moisture from the atmosphere. Running the whole length of the battery are three ducts or pipes, one along the front or entry side conveying the activating gas or air con-

AN ADSORBER UNIT.

nected by branches to each adsorber. Simple two-way dampers are arranged in these branches, and when the plant is functioning five of these dampers are closed to the activating gas or air pipe and open to atmosphere, while the sixth damper closes one adsorber to the atmosphere and opens it to the entry of activating gas or air. On the outlet side of the adsorber battery are two ducts, one for the dried air and one for the wet air from the adsorber which is being activated. Two-way

dampers similar to and mechanically coupled with those on the inlet side of the battery, provide the means for connecting the one activating adsorber to the wet air duct, and the five adsorbing elements to the dried air ducts in rotation. An induction fan is employed for drawing the activating gases or air through the saturated gel and discharging the moisture thus extracted through an uptake to atmosphere.

Structurally, and in its operation, the silica gel dehydrating plant is of the simplest description, its operating cost being mainly that of the heat necessary for activation. The other costs are labour, for which one man is sufficient, and power to the extent of about 20 h.p. The adsorber element is merely a plate steel casing containing mesh-bottomed racks on which the gel rests, these racks being suitably inclined to expose the gel efficiently to the flow of the air of the atmosphere, or activating gas or air, as the case may be. The three ducts for hot gas, dried air, and wet air are constructed of light steel plate. Operation can be made automatic if desired, but attendance for the purpose of throwing over the dampers (in this plant this only requires to be done about every two hours) is such an insignificant item that the first cost of automatic control, unless essential, does not warrant its adoption.

The amount of moisture removal for which this plant is designed is based solely on the requirements of dry blast as required for the economical production of pig iron under existing conditions at the Wishaw works, quality of ores reduced in the furnaces, etc., and in no way indicates the ranges of moisture removal for which silica gel may economically be used. As already stated, the plant is capable of maintaining the moisture content of the blast below 1 grain per cu. ft. if found desirable. Silica gel dehydrating installations can, however, readily be designed for considerably lower humidities than this, for cases where the driest possible air is required; and for the removal of moisture from compressed air it is even more efficient and economical than when treating air at atmospheric pressure. It is of general interest to note that silica gel is chemically inert and indestructible under industrial conditions, and that waste blast furnace gas is being used on the Wishaw silica gel plant for reactivating the gel.

The Non-Metal Mineral Production of Canada

A Review of the Position

Below is given an account, extracted from the preliminary report issued by the Canadian Minister of Trade and Commerce, of the present position of the non-metallic mineral industries of Canada.

CONTINUING the progress made in 1926, when the mineral output of Canada reached a new high record value of $240,437,123, production of metals and non-metals in the first half of 1927 registered a further advance. Among the non-metals the fuels, including coal, natural gas, peat, and crude petroleum, advanced in value 19·8 per cent. in 1926, as compared with the totals for 1925; other non-metallic minerals showed 13·7 per cent. higher values in the aggregate than during the preceding calendar year. Clay products showed a gain of 8·6 per cent., and other structural materials an advance of 5·2 per cent. over the totals for 1925. In the aggregate, the mineral production of Canada in 1926 showed a gain of 6·1 per cent. over the totals for the preceding calendar year.

For comparative purposes there are shown in the following table the values of production for non-metals, fuels, and structural materials from Canadian sources for the past twenty years.

VALUES OF NON-METALLIC MINERAL PRODUCTION OF CANADA BY CLASSES 1907–1926.

Year.	Non-Metallic. Fuels and other non-metallics. $	Structural materials and clay products. $
1907	31,275,546	12,863,049
1908	32,142,784	11,339,955
1909	31,141,251	16,533,349
1910	37,757,158	19,627,592
1911	34,405,960	22,709,611
1912	45,080,674	28,794,869
1913	48,463,709	30,809,752
1914	43,467,229	26,009,227
1915	43,373,571	17,920,759
1916	53,414,983	17,467,186
1917	63,354,303	19,837,311
1918	77,621,946	19,130,799
1919	76,002,087	27,421,510
1920	108,027,947	41,892,088
1921	87,842,682	34,737,428
1922	82,976,794	39,534,741
1923	91,936,732	37,751,381
1924	71,796,009	35,380,869
1925	71,851,801	37,649,234
1926	85,240,144	39,959,398

In the half-year ended June 30, 1927, fuels at $35,087,080 showed an advance of 16 per cent. in their aggregate value in comparison with the corresponding period of 1926. Other non-metals valued at $7,482,322 showed an improvement of 8·3 per cent. over the total for the first half of 1926. Including fuels, the value of the non-metals produced in the first half of 1927 was $42,569,402, an advance of 14·6 per cent. over the total of $37,146,306 reported in the first half of 1926.

Detailed Figures

Advances among the non-metallic minerals were general throughout the list. Production during the half-year in comparison with the totals for the corresponding period of 1926, showed gains of 20·6 per cent. in the tonnage of coal produced, 13·4 per cent. more natural gas, 40·5 per cent. more crude petroleum, 21·2 per cent. advance in feldspar, 32·6 per cent. more gypsum, and 55·9 per cent. more quartz. Greater outputs were also recorded in the cases of bituminous sands, magnesite, mica, pyrites, and sodium sulphate. There was a loss of 6·7 per cent. in the tonnage of asbestos produced in the half-year in comparison with the totals for the first half of 1926, but the output of 123,730 tons, valued at $4,685,706, was not much less than half of the 279,403 tons, valued at $10,099,423, produced during the calendar year 1926. While the tonnages both in the half-year and in the preceding calendar year were slightly less than the corresponding figures for the immediately preceding period the values in both cases were greater. In the half-year the value of the asbestos output showed an improvement of 3·8 per cent. over the total for the first half of 1926, and in the calendar year 1926 the value showed a gain of 12·3 per cent. over the totals for the calendar year 1925.

Graphite, which showed a gain in 1926 of 6·1 per cent. in tonnage and 22·7 per cent. in value over the figures for the preceding calendar year, dropped slightly behind this rate of production in the first half of 1927. Barytes, iron oxides, salt, sodium carbonate, talc and soapstone, while produced in fair tonnages during the half-year, were not produced in quite as great amounts as during the first half of 1926.

The Non-Metals in 1926

Revised figures indicated that in 1926 non-metallic minerals, including coal, showed a gain of 18·6 per cent. in value over the totals for 1925. Most notable of the gains in this list was the increased tonnage of coal produced which showed an improvement of 25·4 per cent.

Feldspar production, too, showed an improvement of 25·3 per cent. in tonnage and 31·5 per cent. in value. Gypsum shipments were considerably greater in 1926 than in the preceding year, and although slightly lower prices prevailed, there was marked increase in the total value. Magnesite showed a lower tonnage, but a greater value due to the higher prices prevailing for this commodity. Noteworthy gains were made in the production of natural gas both in quantity and value. About 13·6 per cent. more gas was produced and the value of the output was 10·5 per cent. higher than the total for the preceding year. Crude petroleum production continued to increase. In fact, gains were general throughout the list.

Structural Materials

Clay products and other structural materials reached a value of $39,959,398, an advance of 6·1 per cent. over the totals for the preceding year. Cement production showed an increased tonnage but a decreased total value. Lime, sand and gravel and stone showed decided gains. Most of the products of the clay-working industries were produced in larger quantities in 1926 than in the preceding year. Clay products as a whole showed a gain of 8·6 per cent. in comparison with the totals for 1925.

Employment in 1926

Employment in the mineral industry in Canada was maintained at about the same average rate throughout 1926 as that prevailing in 1925. The index of employment showed that about 3·5 per cent. fewer persons were listed on the rolls of the operating companies in January, 1926, than were shown on the rolls of the same companies in January, 1920. Employment dropped off slightly in the first five months of the year, but beginning in June a gradual improvement set in which carried the index of employment in December, 1926, to 4·2 per cent. above the number employed in January, 1920. Non-metal mining, including coal mining, showed greater gains than did the metal mining industries, but probably this was due to the fact that in the preceding year these industries were somewhat depressed while metal mining has been enjoying an era of prosperity for several years.

In the operating mines, quarries, and smelters in Canada there were upwards of 65,000 persons employed. This number does not represent the total extent of employment in the mining industry, as there are no records available of the numbers engaged in prospecting and general development work on properties that have not reached the producing stage, nor does it include any allowance for those persons who are engaged in the subsidiary industries directly dependent on the mining industry for their continuance, but in these operating mines, quarries, and metallurgical works there are approximately 45,000 persons employed in Ontario, British Columbia, and Nova Scotia alone. About 20,000 are employed in the metal mining industry and non-ferrous metallurgical works. About 34,000 people are employed in non-metal mining and approximately 11,000 in the production of structural materials and clay products. To all these, salaries and wages totalling approximately 85 million dollars are paid annually. The importance of the purchasing power represented by the employees of Canada's mining industry is sometimes not fully appreciated. Fuel and electricity constitute an expense item reaching a total of almost $20,000,000 a year; much of the progress that has been possible in the mining industry in recent years has been due to the extensive development of hydro-electric power facilities.

Investment in Canadian mines amounts to approximately $632,075,000; of which $253,023,646 represents the investment in non-metal mines and $88,516,534 the cost of properties and plants producing structural materials and clay products. Investments in coal mining account for 23 per cent. of the total capital employed in the mining industry. Natural gas represents another 8 per cent.; cement, 6 per cent.; clay products, 5 per cent.; and stone, 2 per cent.; the other mining industries account for the balance of the capital employed.

The non-metallic mineral production of Canada during the period January 1 to June 30, 1926 and 1927, may be summarised as follows:

		1926.		1927.	
		Quantity.	Value. $	Quantity.	Value. $
Actinolite	Tons	30	375	—	—
Asbestos	,,	132,644	4,512,219	123,730	4,685,706
Barytes	,,	44	824	35	771
Bituminous sands	,,	78	312	291	1,164
Feldspar	,,	13,135	114,016	15,926	139,152
Fluorspar	,,	—	—	—	—
Graphite	,,	1,371	101,291	899	57,591
Grinding pebbles	,,	32	288	—	—
Grindstones	,,	—	—	—	—
Gypsum	,,	250,369	964,638	331,893	1,175,850
Iron oxides	,,	2,821	37,915	2,791	37,610
Magnesite	,,	2,498	72,075	2,801	81,344
Mica	,,	1,148	105,094	1,205	99,577
Mineral water	Gals.	80,313	11,767	121,611	12,850
Natro-alunite	Tons	—	—	—	—
Phosphate	Tons	—	—	69	893
Pyrites	,,	7,015	30,045	21,418	78,931
Quartz	,,	62,314	120,673	97,156	179,216
Salt	,,	124,921	708,664	124,166	785,484
Silica brick	,,	—	—	466	23,250
Sodium carbonate	,,	326	2,282	271	2,710
Sodium sulphate	,,	2,221	11,107	2,471	4,943
Talc and soapstone	,,	7,888	115,113	7,831	113,670
Volcanic ash	,,	—	—	230	1,610
Total		—	6,909,298	—	7,482,322

Notes on Various Products

The increase in shipments of graphite noted during the first half of 1926 was continued in the last six months, and the total for the year was reported at 2,727 tons, worth $194,860. Exports of graphite, crude or refined, in 1926, according to Customs' records, totalled 2,564 tons, appraised at $180,851 as compared with 2,484 tons, at $135,897, exported in 1925. The production of graphite during the first half of 1927 amounted to 899 tons, valued at $57,591. In the corresponding period of the previous year 1,371 tons, valued at $101,291, were shipped. The producers during the period under review were: The Crucible Graphite Co., the Canadian Graphite Corporation, and the Black Donald Graphite Co., Ltd. According to Customs' records, the exports of graphite during the half-year totalled 842 tons.

Shipments of iron oxides in 1926 from Canadian deposits totalled 6,626 tons, valued at $101,843. The previous year's production amounted to 7,118 tons, with a valuation of $91,913. Iron oxides are marketed in two forms—crude and calcined. Crude oxides are dried before shipment, for use in the purification of illuminating gas, while the calcined product is ground, usually for consumption in the paint industry. The total production of iron oxides in Canada during the six months ending June 30, 1927, was 2,791 tons, valued at $37,610. During the first half of 1926 shipments were reported at 2,821 tons, worth $37,915.

Magnesite

While the tonnage of magnesite produced during 1926 decreased, there was a considerable increase in value. The 1926 shipments were recorded at 4,571 tons, evaluated at $137,431; in 1925, shipments totalled 5,576 tons, with a valuation of $122,325. The International Magnesite Co. and the Scottish Canadian Magnesite Co. were the only producers in Canada. During the first six months of 1927 the production of calcined and dead-burned magnesite amounted to 2,801 tons, valued at $81,344. These figures showed a considerable advance over the sales reported during the first year of the preceding year, when 2,498 tons, at $72,075, were marketed. Exportations of calcined magnesite during this period were 413 tons, with a valuation of $10,229.

The production of salt during the first six months of 1927 was 124,166 tons, valued at $785,484. During the corresponding period of last year, shipments amounted to 124,921 tons, at $708,664. Shipments of sodium carbonate crystals during 1926 were somewhat lower than the quantity shipped in 1925. The production for the year under review amounted to 595 tons, at $5,370, as compared with shipments of 1,120 tons, at $8,140, in 1925. The manufacture of soda ash from salt brine is carried on in Canada on a large scale by Brunner-Mond, Ltd., at Amherstburg, Ontario. The production of sodium carbonate crystals during the first six months of 1927 totalled 271 tons, valued at $2,710.

Natural sodium sulphate shipped during 1926 amounted to 6,775 tons, valued at $13,550. Production of sodium sulphate in Canada from the deposits of natural sodium sulphate in the province of Saskatchewan totalled 2,471 tons, valued at $4,943, during the first half of 1927. The imports of salt cake during this period were reported at 13,330 tons, valued at $216,427, while soda, bisulphate of, or nitre cake, amounting to 6,000 tons, at $24,001, and glauber's salt to a total of 65 tons were also imported into Canada.

The Department of Mines, Dominion of Canada, has also issued a book entitled *Canada: Geology, Mines and Metallurgical Industries*, in connection with the Second Triennial Empire Mining and Metallurgical Congress. In this the subject is discussed exhaustively not only in regard to Canada as a whole, but also in regard to each province separately.

Chemicals for the East

Japan and Netherlands East Indies

(From a Correspondent.)

The consumption of chemicals in Japan reaches considerable dimensions, and although the domestic production is being steadily developed in certain directions, this country provides a very valuable market for British manufacturers. During 1925 Great Britain suffered a substantial loss of business in comparison with the previous year, however, and a more serious study of the market's conditions and requirements is needed if this position is to be improved. The figures are as follows :—

Imports into Japan from Great Britain.

	1924. Cwts.	1925. Cwts.
Sulphate of Ammonia	1,179,600	856,440
Ammonium Carbonate	6,540	4,480
Sulphate of Alumina	—	8,380
Sodium Compounds	2,465,141	2,238,865
Ammonium Chloride (Muriate)	14,060	9,360
Borax	2,379	4,946
Carbolic Acid	25,505	20,887
Disinfectants, Insecticides, etc.	1,162	752
Distilled Glycerine	43,036	32,615
Phosphorus	845	840
Potassium Chromate and Bichromate ..	7,958	1,997
Cobalt Oxide	334	191
Other chemical products (except dyes and dyestuffs)	£181,358	£89,165

Heavy Chemicals

With regard to heavy chemicals, caustic soda and soda ash are the two chief products imported into Japan, the last named being mainly obtained from Great Britain whilst United Kingdom firms also supply about two-thirds of the requirements of caustic soda, the remainder being supplied by the U.S.A. The trade in cyanide of potash and soda was at one time in the hands of British manufacturers, but this business is now being captured by American firms. Ammonium chloride, bichromate of potash and carbonate of ammonia are also in very heavy demand, and German manufacturers are increasing their efforts to secure a larger share of the trade.

British manufacturers of fine chemicals and drugs should be readily able to increase their sales in Japan, particularly as German competition in those products is becoming less severe. Moreover, the quality of German goods has been very unfavourably commented upon, and full advantage of this fact should be taken by United Kingdom firms.

Fertilisers

An excellent indication of the amount of business available in chemical fertilisers is given by the following table which relates to the total imports into Japan during 1923, 1924, and 1925 :—

	1923. Piculs.	1924. Piculs.	1925. Piculs.
Sulphate of Ammonia ..	2,429,000	2,807,000	3,392,000
Phosphate Rock for conversion into superphosphates	2,594,000	4,684,000	4,609,000
Nitrate of Soda	1,117,000	674,000	683,000

The use of chemical fertilisers has increased to a large extent in preference to vegetable, animal and fish fertilisers, and an excellent field exists in this direction for British manufacturers.

Sulphate of ammonia is largely obtained from Germany, whose exports to this market increased from 18 piculs in 1923 to 1,771 piculs in 1925; whilst British and American supplies decreased from 760 to 451 piculs, and from 1,441 to 880 piculs respectively during that period. It should be noted that synthetic sulphate has achieved an excellent reputation on account of its whiteness and quality. Later figures indicate an improvement in the British position.

Superphosphate, synthetic sulphate of ammonia, by-product sulphate, and nitric acid are now being produced in appreciable quantities in Japan; but, in spite of developments in this direction, the market for similar imported chemicals should continue to expand.

Germany practically controls the trade in dyestuffs, imports from Great Britain being small apart from intermediary coal tar products, imports of which from the United Kingdom increased from 1,002 cwts. in 1924 to 1,997 cwts. in 1925.

Netherlands East Indies

The Netherlands East Indies is a considerable consumer of chemicals and chemical manures, and although Great Britain has secured a very good share of the import business it should be possible to obtain much better results if a closer study was made of the market's requirements and conditions.

With the adoption of more aggressive selling methods and the quotation of keen prices, Great Britain should at least become the principal supplier of heavy chemicals to this market.

During the first 11 months of 1926 the total imports of caustic soda into the Netherlands East Indies amounted to 3,101 metric tons, of which 1,795 metric tons was obtained from the United Kingdom and 1,154 metric tons from the U.S.A., whilst out of a total importation of 1,376 metric tons of alum during the same period, Great Britain supplied 303 metric tons. With regard to sulphate of ammonia, which is imported as a fertiliser, Germany has increased her shipments at the expense of the United Kingdom.

In addition to heavy chemicals there is an excellent demand for refined chemicals, medicines, patent medicinal foods, photographical chemicals, chemicals required for the manufacture of aerated waters, syrups and cordials, and British manufacturers of these products should find abundant scope for good business. The batik industry is responsible for heavy imports of dyes, and in this branch of the trade Germany has secured the leading position.

This market undoubtedly warrants the closest attention of British chemical manufacturers, and no effort should be spared to secure a larger share of the growing trade at the expense of competitors.

D.O.T. Report on Greece

A Difficult Market

The *Report on the Industrial and Economic Situation in Greece* (May 31, 1927) has just been issued by the Department of Overseas Trade (H.M. Stationery Office, pp. 48, 1s. 6d.). Olive oil forms one of the most important products of the country, but unfortunately, last year, the olive trees were heavily attacked by insects, with the result that the production reached only 63,000 tons, instead of the expected 95,000.

As regards trade, the main characteristic of the market in all branches throughout the year was the preference shown for cheap goods : quality was, and still is, a secondary consideration. In face of this tendency British trade suffered, not only from the general higher level of prices, but from the high exchange rate for sterling. British goods have, however, a good name in Greece, and, prices being equal or approximately so, would generally sell better than those of their competitors.

Home Industries

A new cement works at Volo started operating early in 1926. The factory is worked by a 275 h.p. Diesel engine and a steam turbine operated by hot air revolving furnace of 850 h.p. The company hope to produce some 40 million kgs. annually. The production for the whole of Greece during the last two years was as follows : 1925, 60 million kgs. ; 1926, 86 million kgs. The import of cement from abroad amounted in 1925 to 66 million kgs. (Drs. 58 million). Among other imports in 1925 were 20,581 metric tons of naphtha ; 24,225 metric tons of benzine ; and 14,673 metric tons of petroleum. The exports in the same year included 24,258 metric tons of olive oil ; 7,140 metric tons of colophony ; 1,732 metric tons of turpentine oil ; and 2,702 metric tons of olive kernel oil. Since and including 1921, of the total of 463 factories established in Greece, 30 are concerned with various chemical products. The production of Greek industries in the years 1925 and 1926 respectively included : Metallurgical, 71,750,000 and 78,400,000 drachmae ; chemical, 2,766,350,000 and 3,650,000,000 (the drachma is at present about 370 to the pound sterling). The imports of manufactured articles into Greece in 1925 included : metal industries, 57,404,000 kgs. (158,327,000 drachmae) ; chemical industries, 71,736,600 kgs. (470,657,600 drachmae).

Fixed Nitrogen by the Mont Cenis Process

It is reported that construction will be completed in the near future of two new plants by the Hibernia Co. in the Ruhr district, Germany, to extend production of the Mont Cenis process of direct ammonia synthesis. One is located at the existing plant of the Gewerkschaft Mont Cenis at Sodingen in Westphalia, while the other is being erected on a neighbouring coal pit belonging to Hibernia. Exact details of the capacity of the plants have not been made public, but one authority estimates a probable production of 15,000 metric tons nitrogen annually, or the equivalent of 75,000 tons ammonium sulphate. These figures, however, will hardly be reached in the first year of the operation of these plants. Present production at Sodingen is believed to be no more than four tons of ammonia daily. Mont Cenis is a member of the Ammonia Sales Union, and this will sell perforce through the Nitrogen Syndicate, which controls sales of the German Dye Trust Haber-Bosch production, the calcium cyanamide plants and coke and gas plant sulphate by-product. For this reason a price conflict, as previously expected between Gewerkschaft Mont Cenis and other local producers, is impossible. The Mont Cenis process is claimed to have a cost of production that is 20 per cent. lower than by other existing processes here; namely, the Haber-Bosch and Frank-Caro process of atmospheric fixation. The Mont Cenis process must use sulphuric acid to convert its ammonia to ammonium sulphate, while the Haber-Bosch process employs gypsum.

Safeguarding of Key Industries: Application for Exemption

The Board of Trade give notice that representations have been made to them under Section 10 (5) of the Finance Act, 1926, regarding bromural (monobromisovalerylurea); eukodal (dihydro codeinone hydrochlorate); papaverine; R potassium permanganate; resorcine; and styracol (quaiacol cinnemate). Section 10 (5) of the Finance Act, 1926, is as follows:—"The Treasury may by order exempt from the duty imposed by section one of the Safeguarding of Industries Act, 1921, as amended by this Act, for such period as may be specified in the order, any article in respect of which the Board of Trade are satisfied on a representation made by a consumer of that article that the article is not made in any part of His Majesty's Dominions in quantities which are substantial having regard to the consumption of that article for the time being in the United Kingdom, and that there is no reasonable probability that the article will within a reasonable period be made in His Majesty's Dominions in such substantial quantities." Any person desiring to communicate with the Board of Trade with respect to the above-mentioned applications should do so by letter addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, S.W.1, within one month from September 21.

Production of Sulphuric Acid in Canada, 1926

According to a statement just issued by the Dominion Bureau of Statistics at Ottawa, production of sulphuric acid in Canada in 1926 totalled 108,230 tons (66 degrees Bé), valued at $1,306,254, as compared with 83,396 tons, worth $1,363,618, in 1925. Exports of sulphuric acid from Canada amounted to 28,137 tons, worth $320,324, in 1926, as against 19,178 tons, worth $250,096, in the previous year; practically all the acid was shipped to the United States. Imports totalled only 53 tons, worth $9,245, in 1926, and 52 tons, at $7,821, in 1925. Sulphuric acid was made in eight different plants in Canada in 1926. Two concerns, which also operated by-product coke plants, maintained works to make acid for use in manufacture of ammonium sulphate; four plants produced acid for commercial distribution; one smelter made acid for use in its own metallurgical works, and one fertiliser manufacturer made sulphuric acid for use in the preparation of superphosphate. The following were the companies working plants:—Consolidated Mining and Smelting Co., of Canada, Ltd.; Algoma Steel Corporation; Dominion Iron and Steel Co., Ltd.; Grasselli Chemical Co., Ltd.; Mond Nickel Co., Ltd.; Nichols Chemical Co., Ltd.; and Triangle Chemical Co., Ltd.

Institute Jubilee Celebrations

H.R.H. the Prince of Wales has graciously consented to give his name as a patron to the jubilee celebrations of the Institute of Chemistry, which will be held in London from Wednesday to Friday, December 14 to 16. The Institute was originally incorporated by licence of the Board of Trade under the provisions of Section 23 of the Companies Act, 1867, on October 2, 1877. The council felt, however, that it would be inconvenient to many members, and particularly to those who are engaged in teaching, to hold the celebrations in October, and decided therefore to fix the dates nearer the Christmas vacation in order that every branch of the profession may be well represented. The programme of arrangements will include a conference devoted to education and professional matters, a banquet, and a conversazione. Other societies and institutions concerned with chemistry will be invited to participate in the social functions. The banquet will be held at the Wharncliffe Rooms, Hotel Great Central, London, on Thursday, December 15, Professor Arthur Smithells, C.M.G., F.R.S., president, in the chair.

Manchester Factories and Smoke Regulations

A deputation representing the chemical manufacturers of Manchester waited upon the Public Health Committee of the Manchester Corporation on Tuesday to lay before it what were described as the peculiar difficulties which the chemical industry was under regarding observance of the regulations against the undue emission of smoke. It was pointed out that chemical processes were intermittent, so that a great deal of boiler power was required at one time and perhaps very little at another, thus sometimes creating an undue amount of smoke. The deputation asked the Committee that it should take the facts into consideration when dealing with prosecutions for alleged breaches of the regulations. The Committee intimated that it would deal with each case on its merits, and accepted an invitation to visit one or two chemical works.

Marking of Goods Imported into Australia

A proclamation under the Commonwealth Customs Act prohibits the importation into Australia of goods bearing marking in a language other than that ordinarily used by the people of the country of origin unless there is also applied to the goods, "in conjunction with the marking referred to wherever such marking appears and in conspicuous and legible characters a definite qualifying statement in the English language indicating the country in which the articles were made or produced." The Comptroller-General of Customs, Melbourne, has decided that as regards consignments arriving in the Commonwealth on and after January 1, 1928, goods must be marked strictly in accordance with the proclamation. This will necessitate the application of the statement of origin to that part of the article on which the marking to be qualified appears.

Chemical Engineering Group Meeting

The first meeting of the Chemical Engineering Group will be held on Friday, October 14, when Mr. J. A. Reavell will read a paper on "A Recent Development of Spray Drying." The meeting will be held at the rooms of the Chemical Society, Burlington House, Piccadilly, London, at 8 p.m., Professor E. C. Williams taking the chair. During the afternoon of the day a visit will be paid to the Kestner Experimental Works at Camberwell, where a machine of the type to be described in the evening will be seen at work. As this installation is working in connection with the Merril Oil Heating process the visit will prove of further interest to those not familiar with this form of heating.

International Conference on Trade Regulations

An International Conference of representatives of the Governments of members and hon. members of the League of Nations has been fixed for October 17, with a view to framing an international agreement for the abolition of import and export prohibitions and restrictions. The British Government will be represented by Sir Sydney Chapman, assisted by Mr. H. V. Reade, Mr. Gilbert C. Vyle, and Col. the Hon. F. Vernon Willey.

Fostering British Overseas Trade

Manufacturers Should Visit Trade Commissioners

MR. F. W. FIELD, Senior Trade Commissioner in Canada, reports that a conference of the four Trade Commissioners in Canada was recently held in Vancouver, at which a number of points bearing on the increased efficiency of their offices and the greater development of British trade in Canada were discussed. A good deal of publicity has been given during the last few months to the increased prosperity of the Dominion, and the Trade Commissioners have been in receipt of much correspondence from British firms who appear to think that their share of the business should be proportionately greater. It was agreed that such firms as during the past few years had visited the country and had taken pains to place their distributing organisations on sound bases were reaping and were likely to continue to reap the benefit of their foresight in better times. The fact that it was believed more money is available was unlikely in any marked way to prove of value to firms whose goods were unsuitable or unknown, or who had failed to appreciate the essential needs of the trader in the Dominion. The Commissioners endorsed the remarks made by Mr. Field last year on the great importance of a personal knowledge of the market and its problems, and laid great stress on the value of the contact between United Kingdom manufacturers and their customers in Canada. It was pointed out that the market at the present time should be watched carefully, as methods of distribution are in a stage of transition. While a large number of manufacturers from the United Kingdom call upon the Commissioners, it was noted with regret that some of them do not do so in the course of their visits, often because they are reluctant to cause what they believe to be unnecessary trouble. Too much stress cannot be laid on the desire of the Trade Commissioners to be of any assistance possible to visiting manufacturers from the United Kingdom. They deprecate the policy of some manufacturers of allocating just one or two days to each of the four principal cities of the Dominion. Canada is divided into five main sections, each of which has different living conditions and different buying habits, each of which should be studied.

The Commissioners are satisfied that, if United Kingdom manufacturers will take the time to examine the market carefully and develop their selling organisations on the lines to some extent to which the Canadian importers are accustomed, the Dominion will take an increasing quantity of United Kingdom goods during the next fifteen years. The work being done by the Empire Marketing Board is meeting with increasing appreciation among Canadians who are fully aware of the value to them of the markets of the United Kingdom, and in many parts of the Dominion there seems to be a growing desire to develop a reciprocal trade.

Consideration was given in the course of the Conference to the deliberations of the Tariff Advisory Board of the Canadian Government at Ottawa, and to the possible effect of changes in the tariff on the trade of the United Kingdom with the Dominion.

Vacant Appointments

A Biochemist for the Development Department of the Government of Madras, for research work on cotton to be carried out at Coimbatore. Rs.750-Rs.50-Rs.950 per month. The Secretary to the High Commissioner for India, 42, Grosvenor Gardens, London, S.W.1. October 29.

An Open Fellowship of £200 per annum, established by the Institution of Gas Engineers for post-graduate research in gas chemistry. The Clerk to the Senate, The University, Leeds. September 30.

A Chair of Chemistry in the University of Melbourne, Australia. £1,200. The Agent-General for Victoria, Victoria House, Melbourne Place, Strand, London, W.C.2. October 1.

An Analytical Chemist for the Medical Department, Tanganyika Territory. £600-£30-£720. The Private Secretary (Appointments), Colonial Office, 38, Old Queen Street, London, S.W.1. October 1.

A Lecturer in Chemistry in the University of West Australia. £450-£550. Office of the Agent-General for Western Australia, 115, Strand, London, W.C.2. October 1.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

76 (*Mond Gas Producer Pitch*).—We are interested in the purchase of Mond Gas Producer Pitch and should be glad if you could supply us with the names of firms producing tar by the "Mond" process.

The Acid Industry in Canada

THE first sulphuric acid plant in Canada was erected at London, Ontario, in 1866; there are now seven plants. One, in Nova Scotia, produces acid for local use in coke plants; three in Ontario and two in British Columbia make sulphuric acid for sale, one of the latter using a considerable amount in the manufacture of fertilisers. A plant in British Columbia makes its own acid for use in metallurgical processes. In 1925 considerable interest was manifested in the manufacture of sulphuric acid by the contact process from waste sulphur dioxide gases from the metallurgical works in the Sudbury district.

In 1925 the production of sulphuric acid amounted to 166,791,926 lb. of 66° Be. acid. Exports have been steadily increasing, and in 1925 totalled 38,358,600 lb. For the year ending March 31, 1927, 47,585,600 lb., valued at $267,338, was exported, almost all of which went to the United States. Over one half of the domestic consumption is used in petroleum refining and in the manufacture of ammonium sulphate.

Nitric acid is made in Canada only from sodium nitrate and sulphuric acid. Two unsuccessful attempts have been made to produce acid commercially by the fixation of atmospheric nitrogen. No ammonia oxidation plants have been established. One firm makes the acid solely for its own use in the manufacture of explosives. The production of nitric acid in 1925, according to the latest returns, was 8,687,715 lb. Data on exports are not available, but it is believed that they were small. For the fiscal year ending March 31, 1927, 305,707 lb., valued at $23,018, was imported.

Hydrochloric acid is a by-product obtained in the manufacture of sulphuric acid. Recently it has been manufactured synthetically by one plant from hydrogen gas and chlorine in the presence of a catalyst. Hydrochloric acid is produced by four firms. Imports for the fiscal year ending March 31, 1927, were 365,248 lb., valued at $9,384, entirely from the United States.

"L. and N." Brown Coal Co. Meeting

MR. FRANK HODGES, the former secretary of the Miners' Federation, made his first public speech in his new capacity as managing director of the "L. and N." Brown Coal Co., Ltd., on Monday, when the company held its first statutory meeting in London. The company was recently formed to develop the production of brown coal in Australia. He said that the company had acquired an area in Victoria, Australia, where brown coal deposits were to be exploited by the most up-to-date and scientific methods. Brown coal had been the greatest economic asset that Germany had had for many a long year. Few realised that 70 per cent. of the electricity generated in Germany came from brown coal, which in annual output had now reached 135,000,000 tons. We had no brown coal in this country, but it was hoped to develop that in Australia to the advantage of this country and all concerned. The directors had agreed with him that in the exploitation of that coal they must treat the whole personnel on an enlightened basis. They would encourage the staff to co-operate with the management in making the enterprise a prosperous one, and give them a proper and clearly defined share of the prosperity so developed. The work towards exploitation was well under way. Lieutenant-Colonel Moore-Brabazon said that the future of brown coal on its oil side lay in distillation, followed by production of synthetic alcohol. The board was satisfied with its progress towards early commercial realisation of distillation.

From Week to Week

We regret to announce the death, at the age of 85, of Mrs. Carr, mother of Mr. F. H. Carr, president of the Society of Chemical Industry.

Sir Alfred Mond will, on October 10, address the Publicity Club of London on "The General Industrial Outlook and Advertising."

University News: *Oxford.*—Mr. R. J. Rosser, of University College, Cardiff, has been elected to a Meyricke Scholarship for research in chemistry.

The Australasian Association for the Advancement of Science will hold its nineteenth annual meeting at Hobart, commencing on January 16, 1928.

Indian exports of indigo for July amounted to 240 cwts., bringing the total for the first six months of the year to 1,127 cwts. as compared with 1,492 cwts. a year ago.

Egyptian phosphates exports increased in value during the first quarter of 1927 to £58,800, as compared with £14,400 during the parallel period of 1926. Larger shipments to New Zealand, Ceylon, and Japan accounted for the substantial gain.

The directors of the Sulphide Corporation announce that in consequence of the fall in metal prices, they are reluctantly obliged to suspend mining operations at the Junction Mine. Mining and milling operations at the Central Mine will continue as usual.

"Fire Risks in Industry," a lecture delivered by Mr. A. C. Cameron a short time ago before a joint meeting of the Edinburgh local sections of the Institute of Chemistry and the Society of Chemical Industry, has been published in pamphlet form by the Institute of Chemistry.

An "All-British" Trade Exhibition will be held at Melbourne from February 23 to April 2, 1928. The Federation of British Industries is responsible for the organisation of British participation in the exhibition, and among the firms which will take part are Imperial Chemical Industries, Ltd., and Bell's United Asbestos Co., Ltd.

Dr. G. D. Rosengarten, president of the American Chemical Society, has been advised by the Society not to become a member of the "Committee for American Participation in the Maison de la Chimie," on the ground that this would commit the Society to a project which it cannot approve. The Society will, however, be represented at the Berthelot Centenary Celebration in Paris in October.

German and French potash interests are stated to be uniting their interests, according to an American report. Early in June the German and French syndicates formed in Brussels the "Soc. Anon. Belge Comptoir des Sels de Potasse" to buy and sell potash, chemical products and fertilisers. Another current report says in effect that the German and French potash syndicates have united their sales agencies in the "N.V. Vereinigte Kali," Amsterdam.

Ten men were injured in an explosion which occurred on September 16 at the works of Scottish Dyes, Earls Road, Grangemouth. The injured men (process workers) were engaged in "H" building when some of the material which was being employed in a process which was in operation became ignited. An explosion followed, the noise of which was heard two miles away, and flames shot many feet into the air. The roof was destroyed, and all glass about the brick building shattered, while the wood sections were burned. A. Rae, Falkirk, was taken to Falkirk Infirmary suffering from extensive burns. The other men, however, were able to go home.

The British Engineering Standards Association has just issued British standard specifications for ready-mixed linseed oil paint (oil gloss), green, black, and red oxide of iron, lithopone oil paste (Class 1, natural or mixed oxides, Class 2, oxide or iron base) for paints. The specifications have been prepared at the request of the paint manufacturers by a representative committee. Other specifications in hand are those for purple oxides of iron, paste driers, japan gold size, ochre, ultramarine blue, amber, sienna, non-setting red lead, black oxide of iron, black oil paste, Indian reds, Brunswick or chrome greens. Copies of the six new specifications, Nos. 294-5, 297-9, 1927, can be obtained from the B.E.S.A. Publication Department, 28, Victoria Street, London, S.W.1.

Automatic and Electric Furnaces, Ltd., state that owing to the continued expansion of their business they have found it necessary once more to remove their offices and works to larger premises, and on and after September 29 their address will be: Elecfurn Works, North Road, Holloway, London, N.7 (Telegrams: Elecfurn, Holway, London; cables: Elecfurn, London; telephone: North 5221). The new works have been fitted with lifting equipment to deal with the manufacture of electric furnaces up to 6 tons in weight, and the most modern methods have been installed for case making, etc. A large demonstration room fitted with numerous types of electric furnaces and adequate facilities for quenching the largest articles that are likely to be met with have also been installed.

Mr. A. Nesfield, who has been in Germany investigating the method of oil distillation from brown coal, is returning to Australia as mine manager of the "L. and N." Co. at Morwell.

Mr. J. D. Rockefeller, the American millionaire, has offered the sum of half a million Danish kroner (about £28,000) for the building of an Institute of Chemical Research in Copenhagen.

Widnes Town Council have resolved to take no objection to the laying of a brine pipe by the United Alkali Co. in or under Dock Road, West Bank Street, Waterloo Road, and Tanhouse Lane, Widnes.

Diseases of occupation reported during August under the Factory and Workshop Act, etc., included six cases of aniline poisoning. Fatal industrial accidents reported in the same month included one in the chemical, etc., industry.

Professor E. C. C. Baly, F.R.S., of Liverpool University, publishes in the current *Proceedings* of the Royal Society (jointly with his co-workers) three papers on the photosynthesis of naturally occurring compounds. This is a continuation of the work on the same subject published previously by Professor Baly.

A factory for the production of artificial leather is to be erected near Melbourne by Nobel Chemical Finishes (Australia), Ltd., a new company which has recently been registered in Victoria, with capital of £250,000 in £1 shares. The principal shareholder in the new undertaking is Nobels (Australia), Ltd., Melbourne.

Sulphur production in Sicily in 1926 amounted to 208,740 metric tons, an increase of 742 tons over 1925. Exports, however, declined to 214,770 tons, as compared with 255,204 tons in 1925. The Sulphur Consortium has eliminated all exporters by creating a subsidiary society to handle the sale of ground and refined sulphur.

The Swedish Match Co. states that a new match company has been formed in Japan under the title of "The Great Amalgamated Match Co., Ltd.," which will take over all the factories belonging to the Tokio Match Co., the biggest company in Japan, which has hitherto been the chief competitor of the Swedish company there. The new company is also taking over the Nippon Match Co. and the Koyekisha Match Co., which already belong to the Swedish company.

Unemployed insured persons in the chemical manufacture industry in Great Britain at August 22 numbered 6,053 (males 5,275, females 778); in explosive manufacture, 1,064 (males 743, females 321); in paint, varnish, red and white lead, etc., manufacture, 689 (males 553, females 136); in oil, grease, glue, soap, match, etc., manufacture, 5,303 (males 4,387, females 916). The percentage unemployment in the same industries in the above order was: 6·4, 5·7, 4·0, and 6·6.

Institute of Chemistry News.—The Institute has received from the executor of the late Mr. Alexander Watt a legacy of £50 for the Benevolent Fund, and also his collection of photographic negatives of titles, pictures, and portraits from books on alchemy, chemistry, early science, and other literature which he bequeathed to the library. The collection consists of over 500 plates and films.—Mr. Arthur R. Smith has been appointed to represent the Institute at the Seventh Congress of Industrial Chemistry to be held at Paris from October 16 to 27. The Congress will be followed by the celebration of the centenary of the birth of Marcelin Berthelot, at which the Institute will be represented by Professor J. F. Thorpe, vice-president.

Sugar Beet News.—As a result of strong opposition, plans for the building at Hereford of a sugar beet factory by British Sugar Developments have been abandoned for the time being. The danger of effluents to the Wye salmon fishing was the basis of most objections. It is stated that a factory will probably be built on the coast.—Sugar Industries Auxiliaries, Ltd., London, have acquired the option of a site near the River Axholme, at Brigg, for the erection of a beet sugar factory for 1928. It is estimated that the scheme will cost a sum approaching half a million pounds. In connection with the scheme a recent conference of users of the river decided to form an association to protect their interests, since the opinion was held that if such a factory were erected it would necessitate lowering the river in dry weather.

Obituary

Lauchlan Macquarie Stewart, on August 9, in his fortieth year, following an operation. During the war he was employed as a chemist at H.M. Factory, Irvine, and was later for a time with L. B. Holliday and Co., Ltd. In the period 1919–22 he was assistant lecturer and demonstrator in the University of Birmingham. At the time of his death he was engaged in private coaching in London.

Dr. James Mathew Petrie, at Sydney, on March 30, aged 56. Dr. Petrie held positions in New South Wales as assayer and chemist to the Deep Creek Gold Mining Co., assayer to the Royal Mint, Sydney, and analytical chemist in the Geological Laboratory of the Department of Public Instruction; and more lately was appointed lecturer in chemistry and assayer at Sydney Technical College. He was employed for some time under Professor Liversidge in research on the natural resources of New South Wales.

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GENERAL.—Vitamins and the preserved food industry. A. Pellerin. *Chim. et Ind.*, August, pp. 211–215.

Phosphatic fertilisers in 1926. J. H. Lucas. *L'Ind. Chem.*, August, pp. 348–349.

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The action of oxalic acid on some soluble salts of lead. N. Demassieux. *Comptes Rendus*, August 22, pp. 460–461 (in French).

The action of hydrogen on the salts of tin at high temperatures and pressures. W. Ipatieff and W. Niklaeff. *Comptes Rendus*, August 22, pp. 462–463 (in French).

Miscellaneous

FLAME.—Studies on the inflammability of hydrogen. IV. Influence of dimethyl selenide and dimethyl telluride on the limits of inflammability of hydrogen-air mixtures. Y. Tanaka and Y. Nagai. *Proc. Imp. Acad. Japan*, June, pp. 348–351 (in English).

Least energy required to ignite mixtures of air and the vapour of ethyl ether. Y. Nagai and M. Furihata. *Proc. Imp. Acad. Japan*, June, pp. 352–354 (in English).

Effects of ethyl bromide on the least energy required to ignite mixtures of air and the vapour of ethyl ether. Y. Nagai and M. Furihata. *Proc. Imp. Acad. Japan*, June, pp. 355–360 (in English).

GENERAL.—The passivity of metals. F. Meunier. *Bull. Soc. Chim. Belg.*, July, pp. 435–447 (in French).

The oxidation of wood-charcoal with sulphuric acid. E. Philippi and R. Seka. *Monatshefte*, August 20, pp. 375–389 (in German).

INORGANIC.—Oxidations with fluorine. VII. Action of fluorine on water and on solutions of alkali hydroxides. VIII. The labile peroxide from sulphuric acid. IX. Action of fluorine on phosphoric acid, phosphates and pyrophosphates. X. Action of fluorine on carbonates and borates. F. Fichter and W. Bladergroen. *Helv. Chim. Acta*, July, Vol. 10 (4), pp. 549–552, 553–559, 559–565, 566–570 (in German).

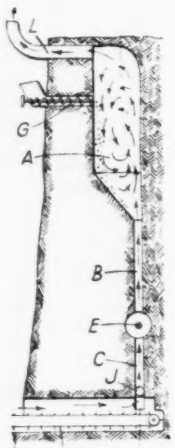
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

276,066. Lime, Gypsum, Calcareous, and/or Aluminiferous Cements and the Like, and Calcination of Ores, Kilns for. G. Martin, "Woodleigh," Bassingham Road, Wembley, Middlesex. Application date, May 17, 1926.

In this apparatus the average speed of the heating gases in the clinkering or sintering zone is maintained at least four times as great as that of the gases in the preliminary heating or decarbonating zone. The kiln comprises an upper heating portion *A*, an intermediate narrower clinkering zone *B*, and a cooling zone *C*. The heating gases are supplied by burners *E* fed with liquid, gaseous, or powdered fuel, and the raw materials are introduced into the upper portion *A* at *G*. The hot clinker is withdrawn by a conveyor *H*, and the air for combustion is introduced through the hot clinker at *J*. The preliminary zone *A* is arranged asymmetrically with relation



276,066

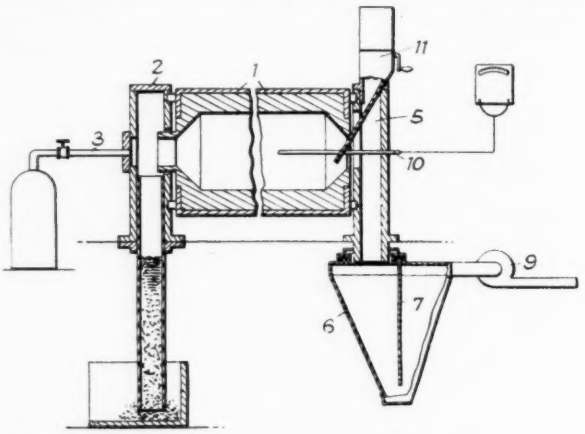
to the shaft *B*, and the ascending hot gases from *B* cause a circulation of gases as shown by the arrows, so that the fine particles of raw material introduced at *G* are carried downwards and are not swept away by the gases through the conduit *L*. The horizontal cross sections of the kiln and shafts are narrow rectangles, and the formation of the roof is thus facilitated.

276,112. Metal Phosphides and Mixtures containing them, Process for Forming. W. Koehler, 792, Lakeview Road, Cleveland, Ohio, U.S.A. Application date, June 25, 1926.

The metal is finely comminuted and mixed with the phosphorus, which is also comminuted. Phosphorus may be obtained in this condition by dissolving in carbon disulphide and evaporating the latter, or the phosphorus solution may be mixed with the metal and the solvent eliminated by pressing in a mould. Alternatively, the phosphorus is first converted into red phosphorus by heating to 230° C. out of contact with air, and then mixed with metal. An example is given in which a mixture of copper and phosphorus is pressed and heated to 260° C. In the production of anti-friction compounds, a lubricating material such as graphite may be added to the copper and phosphorus.

276,120. Chromium Compounds, Production of. L. Mellersh-Jackson, London. From The Mathieson Alkali Works, 250, Park Avenue, Manhattan, New York. Application date, July 20, 1926.

The object is to obtain pure chromium compounds from chromite without the usual intermediate formation of chromates. The ore is first reduced in an electric furnace to give a compact mass of fused metal, the metals other than chromium and iron being removed in the slag. The chromium-iron alloy is preferably comminuted to 40-mesh and treated with chlorine preferably at about 550° C. Heat is liberated, but the temperature must not exceed 650° C. To avoid a temperature which is too high at first and too low after, the material may be mixed with an inert substance such as sand, which at first takes up heat and then gives it out. The ferric chloride formed vaporises at 400° C. leaving chromic chloride, which



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may be blown away from the sand. The chromic chloride is cooled out of contact with air until its temperature is below 250° C. Chromic chloride may be converted into chromous chloride by heating to 800° C.

A rotating or oscillating vessel 1 is provided with a refractory lining and at one end is secured to a vertical casing 2 provided with a chlorine inlet 3. The casing 2 provides a tall and narrow column of the chlorinated material out of contact with air so that it may cool down to below 250° C. Since the upper end is at a temperature above 500° C. the ferric chloride does not remain in it but passes to the chamber 5 at the opposite end, and thence to a condenser 6 having a vertical baffle 7 and connected to a suction fan 9. A pyrometer 10 projects into the chamber 1, and the material is supplied from a hopper 11. The chromic chloride can be produced in either the soluble or insoluble form, the former of which always contains some chromous chloride and is particularly suitable in tanning and dyeing. Other chromium compounds are obtained by known methods.

276,126. Products of Conversion of Peri-Cyannaphthalene Sulphonic Acids, Process for Manufacturing. W. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 28, 1926.

Peri-cyannaphthalene-sulphonic acids, their derivatives substituted in the sulphonic acid group, the esters, sulphochlorides and sulphoamides in particular and nuclear substitution products are treated with alkaline or acid acting agents. In an example in which the 8-cyannaphthalene-1-sulphonic acid is treated, the 8-naphthamide-1-sulphonic acid is first formed as an intermediate product, and on further treatment with caustic alkalies or alkaline earths the sulphonic group is split off and the 1:8-amino-naphthoic acid is obtained as final product either in the form of its inner anhydride (naphthostyril) or as such or as a salt.

If the 8-cyannaphthalene- or 8-naphthamide 1-sulphonic acid is treated with concentrated hydrochloric or sulphuric acid, ammonia is split off and the inner anhydride of the 1-sulphonaphthalene 8-carboxylic acid is obtained. This may be heated with water to obtain the 1-sulphonaphthalene-8-carboxylic acid. Either the acid or the anhydride may be

heated with caustic alkalies to obtain the 1:8-hydroxynaphthoic acid.

The 8-cyannaphthalene 1-sulphonic acid and its nuclear substitution products are obtained by converting the 8-aminonaphthalene-1-sulphonic acid and its nuclear substitution products into the diazo compound and treating these with cuprous cyanide according to the Sandmeyer reaction. A large number of examples are given.

276,155. Molybdates, Process of Producing. A. Kissock, 4,929, Melrose Hill, Los Angeles, Cal., U.S.A. Application date, September 4, 1926.

The process is more particularly for the protection of calcium molybdate for use in the manufacture of molybdenum steel. Molybdenum trioxide is mixed with a basic oxide or hydrate other than a base of an alkali metal. Water is added to form molybdate which is then heated to form a dry powder. The basic hydrate employed is preferably hydrated lime, and the materials are mixed in a finely divided form.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: —255,839 and 255,861 (A. Binz and C. Rath), relating to organic arseno compounds, see Vol. XV, p. 331; 267,925 (I. G. Farbenindustrie Akt.-Ges.), relating to aldehydes, see Vol. XVI, p. 515; 268,323 (S. Seelig), relating to cracking oils, see Vol. XVI, p. 535.

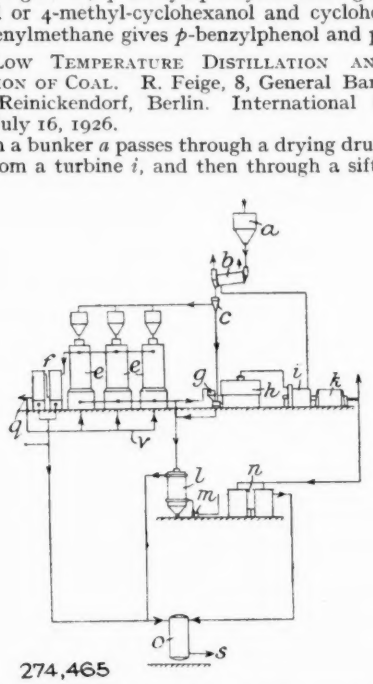
International Specifications not yet Accepted

274,439. Phenols. Chemische Fabrik auf Actien vorm. E. Schering, 170, Mullerstrasse, Berlin. International Convention date, July 14, 1926.

Dioxydiphenylmethane derivatives, other than those produced by condensing ketones with phenols, are subjected to catalytic hydrogenation whereby the bridge between the two phenolic residues splits and each component takes up either one or seven atoms of hydrogen according to the nature of the catalyst employed. Thus *p*-dioxydiphenylmethylmethane yields *p*-ethylphenol and phenol by hydrogenation under pressure with a nickel catalyst containing bismuth, and 4-ethylcyclohexanol and cyclohexanol when the nickel catalyst contains manganese; *p*-dioxydiphenylmethane gives *p*-cresol and phenol or 4-methyl-cyclohexanol and cyclohexanol; *p*-dioxytriphenylmethane gives *p*-benzylphenol and phenol.

274,465. Low Temperature Distillation and Hydrogenation of Coal. R. Feige, 8, General Barby-Strasse, West Reinickendorf, Berlin. International Convention date, July 16, 1926.

Coal from a bunker *a* passes through a drying drum *b* heated by gases from a turbine *i*, and then through a sifter *c*. The



274,465

finer coal is used in the boiler *h*, and the coarser passes into retorts *e*. The vapour passes from the condenser *f* through a pipe *v* into the retorts. Part of the coke is used in the boiler, and part passes to a generator *l*, while electric current from a dynamo *k* generates oxygen electrolytically in plant *n* and supplies it to the generator *l*. The generator gas and the hydrogen pass to the hydrogenating plant *o* for treating the tar or gas from the condenser *f*.

274,488. Aldehydes. Soc. Anon. Distilleries des Deux-Sèvres, Melle, Deux-Sèvres, France. International Convention date, July 14, 1926.

Acetaldehyde or a homologue is condensed in aqueous solution with caustic soda or potash, lime, baryta, or alkaline carbonates and cooled. The solution is acidified and distilled. In examples, crotonic aldehyde is obtained from acetaldehyde, and α-ethyl-β-propyl-acrolein from butylaldehyde.

274,492. Alcohols. Compagnie de Bethune, Bully-les-Mines, Pas-de-Calais, France. International Convention date, July 17, 1926.

A catalyst for the synthesis of methanol is obtained by depositing formates of metals giving irreducible oxides, on a support of pumice, asbestos, charcoal, or activated carbon. Suitable metal salts are those of uranium, tungsten, vanadium, zinc, glucinum, chromium, and titanium.

274,501. Synthetic Resins. P. Haller, 37, Freiestrasse, Berne, and H. Kappeler, 50, Rutlistrasse, Basle, Switzerland. International Convention date, July 16, 1926. Addition to 266,358.

Specification 266,358 (see The Chemical Age, Vol. XVI, p. 429) describes the condensation of an arylamine with formaldehyde and the treatment of the product with an alkali or alkaline salt. In this invention, the primary condensation product is treated with an organic base, a neutral or acid salt, or an organic acid. Examples are given of the treatment of the condensation product from formaldehyde and aniline with methylamine, pyridine, sodium sulphite or bisulphite, ammonium chloride or sulphide, lead acetate, acetic acid, tannic acid, or tannin.

274,828. Purifying Oils and Waxes. I. G. Farbenindustrie Akt.-Ges., 28, Mainzerlandstrasse, Frankfort-on-Main, Germany. International Convention date, July 21, 1926.

Mineral oil is refined with acid and alkali, and then bleached by alkaline hypochlorites in the presence of agents other than acids, which promote the decomposition of the hypochlorite, or of bicarbonates or other acid salts which are adapted to remove caustic alkali. Salts of nickel, cobalt, and copper are suitable. Examples are given of the purification of mineral oil and petroleum jelly.

274,846. Reduction of Metallic Salts and Production of Ammonia. Soc. Internationale des Procédés Prudhomme Houdry (formerly Soc. Internationale des Procédés Prudhomme), 1, Avenue de Villars, Paris. International Convention date, July 23, 1926.

In the reduction of metallic salts by hydrogen, or the synthesis of ammonia, the hydrogen is first passed over nickel or an oxide, which converts it into the nascent form. Nitrogen may be admitted into the chamber containing the nickel, and ammonia is then obtained.

274,858. Drying Fuel; Destructive Hydrogenation. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 21, 1926.

Coal, peat, wood, tar, or mineral oils are dried by heating to above 200° C. at such a pressure as to maintain the moisture liquid, and then running off the liquid. Solid fuel is previously made into a paste with a fuel which is liquid at the temperature used. The fuel obtained is particularly suitable for destructive hydrogenation.

Latest Notifications.

277,285. 3, 4 diamino benzoyl *o*-benzoic acids, and a process of making the same. Newport Co. September 13, 1926.

277,295. Chromium plating. Metals Protection Corporation. September 9, 1926.

277,296. Polishing of chromium. Metals Protection Corporation. September 9, 1926.

277,297. Photographic films. I. G. Farbenindustrie Akt.-Ges. September 9, 1926.

277,311. Method of recovering oil from fatty solutions of proteins and glues in water. Aktiebolaget Separator. September 8, 1926.

277,317. Manufacture of sulphonated cellulose derivatives. I. G. Farbenindustrie Akt.-Ges. September 10, 1926.

277,338. Method of preparing dithiazyl disulphide. Goodyear Tire and Rubber Co. September 7, 1926.

277,342. Manufacture of benzanthrones and intermediate products. I. G. Farbenindustrie Akt.-Ges. September 10, 1926.

277,357. Process of and apparatus for the production of mixtures of mineral oil products and aliphatic alcohols. Kirschner, J. September 9, 1926.

277,371. Manufacture of pigment dyes. I. G. Farbenindustrie Akt.-Ges. September 11, 1926.

277,372. Manufacture of 1-methyl-2 : 5 : 6-trichloro-3-aminobenzene-4-sulphonic acid. I. G. Farbenindustrie Akt.-Ges. September 11, 1926.

Specifications Accepted with Date of Application

252,745. Dyes, Methods of manufacturing. H. T. Bucherer. May 29, 1925.

253,946. Solutions containing organic phosphorus and complex gold compounds, Manufacture of. L. Cassella and Co., Ges. June 22, 1925.

257,250. Mineral oil distillation. Red River Refining Co., Inc. August 24, 1925.

260,544. 2- (or 3)-chloro-quinizarine, Process of preparing. Newport Co. November 2, 1925.

267,560. Electrolysing solutions of alkali metal chlorides, Apparatus for. E. Krebs. March 15, 1926.

269,499. Cracking of oils, Process and apparatus for. T. C. Jungersen. April 16, 1926. Addition to 268,323.

269,878. Lithium containing silicates, Process of treating—by means of neutral alkali salts. Metallbank und Metallurgische Ges. Akt.-Ges. April 22, 1926.

276,727-8. Dispersion of solids in liquids, Process and apparatus for. W. H. Whatmough. May 29, 1926.

276,743. Tin ores, Treatment of. H. L. Sulman and H. F. K. Picard. June 2, 1926.

276,757. Dyeing artificial silk, Process for. British Dyestuffs Corporation, Ltd., J. Baddiley, P. Chorley, and C. Butler. June 7, 1926. Addition to 276,450.

276,766. Benzanthrone derivatives, Manufacture of. British Dyestuffs Corporation, Ltd., J. Baddiley, A. Shepherdson, and S. Thornley. June 19, 1926.

276,767. Black and grey vat dyestuffs, Process for the manufacture of. British Dyestuff Corporation, Ltd., and S. Thornley. June 19, 1926.

276,768. Vat dyes, Process for the manufacture of. British Dyestuffs Corporation, Ltd., J. Baddiley, A. Shepherdson, and S. Thornley. June 21, 1926.

276,911. Chemically pure aluminium, Method for the manufacture of. Deutsche Versuchsanstalt für E. V. Luftfahrt. December 2, 1926.

276,007. Obtaining light hydrocarbons from animal or vegetable oils by the simultaneous action of heat, hydrogen under pressure, and a de-hydrating catalyst, Process of. J.-M. F. D. Florentin, A. J. Kling, and C. Matignon. December 17, 1925.

Applications for Patents

Carbide and Carbon Chemicals Corporation. Paint, etc., removers. 24,008, 24,009. September 12. (United States, February 26.)

Dreyfus, H. Manufacture of cellulose derivatives. 24,123, 24,124. September 13.

Fairweather, H. G. C., and Selden Co. Catalytically oxidising sulphur dioxide. 24,211. September 14.

Fairweather, H. G. C., and Selden Co. Preparation of vanadic acid. 24,236. September 14.

Hentrich, W. Manufacture of *N*-ω-amino-alkylaminonaphthalene carboxylic acid. 23,982. September 12.

I. G. Farbenindustrie Akt.-Ges. Manufacture of benzanthrones, etc. 23,529. September 7. (Germany, September 10, 1926.)

I. G. Farbenindustrie Akt.-Ges. Supports for manufacture of sheets of material soluble in organic solvents. 23,641. September 8. (Germany, October 16, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of anthraquinone derivatives. 23,771. September 9. (Germany, December 9, 1926.)

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Shoe polishes, etc. 23,952. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for continuous separation of liquid mixtures. 23,953. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Fertilisers. 23,954. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of hydrocarbons. 23,955. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Dyestuffs. 23,956, 23,958. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Carrying out photochemical reactions. 23,957. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of plasters, etc. 23,959, 23,960, 23,962. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Recovery of volatile organic solvents. 23,961. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of artificial rubber. 23,963. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Sulphonic acids. 23,964. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Lubricating oils. 23,965. September 12.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Treatment of vegetable, etc., material. 24,194. September 14.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Printing on textile fabrics. 24,196. September 14.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of sulphonic acids. 24,197. September 14.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of polyvalent alcohols. 24,198. September 14.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Application of condensation products of aldehydes. 24,199. September 14.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for catalytic conversion of hydrocarbons. 24,322. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Means for hardening paraffins, etc. 24,323. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Decolorising montan wax. 24,324. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Fertilisers. 24,325. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Apparatus for carrying out exothermic gas reactions. 24,326. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of ammonia from its elements. 24,327. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of raw rubber from latex. 24,328. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Noninflammable nitrocellulose lacquers. 24,329. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of chromium dyestuffs. 24,330. September 15.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of valuable liquid, etc., hydrocarbons, etc. 24,534. September 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of impregnating compositions. 24,535. September 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Process for vaporising formamide. 24,536. September 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of moulded silica gels. 24,537. September 17.

I. G. Farbenindustrie Akt.-Ges. Manufacture of pigment dyes. 23,944. September 12. (Germany, September 11, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of 1-methyl-2:5:6-trichloro-3-aminobenzene-4-sulphonic acid. 23,945. September 12. (Germany, September 11, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of *N*-ω-amino-alkylamino-naphthalene carboxylic acid. 23,982. September 12.

I. G. Farbenindustrie Akt.-Ges. Treatment of hydrated cellulose. 24,102. September 13. (Germany, October 5, 1926.)

I. G. Farbenindustrie Akt.-Ges. Supports for manufacture of sheets of material soluble in organic solvents. 24,103. September 13. (Germany, April 9.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of motor fuels. 24,120. September 13. (October 2, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of amino-cellulose derivatives. 24,215. September 14. (Germany, October 30, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of benzanthrone carboxylic acids. 24,216. September 14. (Germany, September 20, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 24,442. September 16. (Germany, December 23, 1926.)

Imperial Chemical Industries, Ltd. Dyes, etc. 23,658. September 8.

International Combustion, Ltd. Pulverised-fuel burners. 23,414. September 6.

International Combustion Engineering Corporation. Distillation of tar, oil, etc. 23,417. September 6. (United States, September 21, 1926.)

Jungmann, K., and Kolbert, O. Manufacture of solid alcoholic solution of free iodine. 23,552. September 7. (Germany, September 21, 1926.)

Kirschner, J. Production of mixtures of mineral oil products and aliphatic alcohols. 23,715. September 9. (Germany, September 9, 1926.)

Lander, C. H., and Sinnatt, F. S. Treatment of coal, etc. 24,518, 24,519. September 17.

Naamlooze Vennootschap Nederlandsche Kunstzijdefabriek. Preparing artificial textile products from acetyl cellulose, etc. 23,350. September 6. (Holland, May 28.)

Pope, R. W. Dyes, etc. 23,658. September 8.

Robson, S. Preparation of sulphuric acid, etc. 23,391. September 6.

Technical Research Works, Ltd. Apparatus for hydrogenation of organic compounds, etc. 23,316. September 5.

Zelewski, R. von. Manufacture of sulphuric acid. 24,121. September 13. (Germany, September 13, 1926.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8d. to 8¼d. per lb. Crude 60's, 2s. 6d. to 2s. 7d. per gall.

ACID CRESYLIC 99/100.—2s. 9d. to 2s. 10d. per gall. 97/99.—2s. 4d. to 2s. 5d. per gall. Pale, 95%, 2s. 2d. to 2s. 3d. per gall. Dark, 90%, 1s. 9d. to 1s. 10d. per gall.; 95%, 2s. 1d. to 2s. 2d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Crude 65's, 9¼d. to 9¾d. per gall., ex works in tank wagons. Standard Motor, 1s. 1½d. to 1s. 2½d. per gall., ex works in tank wagons. Pure, 1s. 5d. to 1s. 7d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 4d. to 1s. 9d. per gall. Firm. Pure, 1s. 6d. to 2s. per gall.

XYLOL.—1s. 3d. to 1s. 10d. per gall. Pure, 2s. 5d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 8d. to 9d. per gall. Heavy, 8¾d. to 9d. per gall. Standard specification, 7¼d. to 7¾d. ex works. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 9d. to 10d. per gall. Solvent 90/160, 8½d. to 9¼d. per gall. Solvent 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 8½d. to 1s. 3d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £12 per ton. Quiet. Flaked, £12 10s to £13 per ton, according to districts.

PITCH.—Medium soft, 87s. 6d. to 95s. per ton, f.o.b., according to district. Market firm.

PYRIDINE.—90/140, 5s. 9d. to 6s. 6d. per gall. 90/180, 4s. 6d. to 5s. per gall. Heavy, 4s. to 4s. 6d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—7½d. per lb. naked at works.

ANILINE SALTS.—7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 7½d. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8½d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

N. W. Acid.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 to £9 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 3½d. to 2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 40s. to 43s. per cwt.; powder, 44s. to 47s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 7d. to 1s. 8d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P.—1s. 2½d. to 1s. 3½d. per lb.; Technical.—11½d. to 1s. per lb. Good demand.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 3½d. per lb., less 5%. Firm market.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: 1s. per lb.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 9s. 10d. per lb.
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11½d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 26s. to 29s. per cwt. according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 9½d. to 1s. 10½d. per lb.; sodium, 2s. to 2s. 1d. per lb.; ammonium, 2s. 2d. to 2s. 3d. per lb.; granulated, ½d. per lb. less; all spot.
CALCIUM LACTATE.—1s. 2d. to 1s. 3½d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. 1d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—Prices for Winchester quarts; dozen Winchester quarts; carboys or drums; and 10 cwt. lots respectively: ·730—1s. 2½d.; 1s. 2d.; 1s. 1½d.; 1s. 0½d.; ·720 technical—1s. 5½d.; 1s. 5d.; 1s. 4½d.; 1s. 3½d.; ·720 pur. (Aether B.P., 1914)—2s. 4d.; 2s. 3½d.; 2s. 3d.; 2s. 2d.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—5s. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. 3d. per gal. In carboys, Winchesters, 2s. 11d. to 3s. 9d. per gal.; 20 vols., 4s. 3d. per gal.; Winchesters, 5s. to 6s. 6d. per gal. Special prices for larger quantities.
HYDROQUINONE.—2s. 11d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—19s. to 22s. per cwt., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 17s. 9d. per lb. net; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 11s. 3d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 10d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 9d. per lb.
METHYL SULPHONAL.—9s. 6d. to 9s. 9d. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 9d. to 3s. per lb.
PHENAZONE.—4s. 3d. to 4s. 6d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—98s. per cwt less 2½%.
POTASSIUM CITRATE.—B.P.C., 1911; 1s. 8d. to 1s. 11d. per lb.; U.S.P.; 1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz. bulk in 100 oz. tins.
RESORCIN.—3s. 9d. to 4s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. to 2s. 1d. per lb. for 1-cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 8d. to 1s. 9d. per lb. Crystal, 1s. 8½d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 10s. to 10s. 3d. per lb., according to quantity. Firmer. Natural, 1 4s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL), 10s. 6d. per lb
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—16s. 3d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 9d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. per lb.
GERANIOL (PALMAROSA).—18s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. per lb.
NEROLIN.—4s. 6d. per lb.
PHENYL ETHYL ACETATE.—12s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 8d. per lb.
VANILLIN.—17s. 9d. per lb.

Essential Oils

ALMOND OIL.—11s. per lb.
ANISE OIL.—3s. per lb.
BERGAMOT OIL.—28s. per lb.
BOURBON GERANIUM OIL.—14s. 6d. per lb.
CAMPHOR OIL.—75s. per cwt.
CANANGA OIL, JAVA.—26s. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—7s. 6d. per lb.
CITRONELLA OIL.—Java, 1s. 10d. per lb., c.i.f. U.K. port for shipment over 1928. 1s. 6d. per lb., prompt shipment from Java. Ceylon, pure, 1s. 8d. per lb.
CLOVE OIL.—5s. 6d. per lb.
EUCALYPTUS OIL.—2s. 3d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 18s. 9d. per lb.
LEMON OIL.—8s. per lb.
LEMONGRASS OIL.—4s. 6d. per lb.
ORANGE OIL, SWEET.—11s. 3d. per lb.
OTTO OF ROSE OIL.—Anatolian, 30s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—10s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 16s. 9d. per lb.; Japanese, 8s. 3d. per lb.
PETITGRAIN OIL.—7s. 9d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 16s 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, September 22, 1927.

THERE has been an improvement in business during the past week and more confidence is shown. Prices generally remain very firm, and stocks of most commodities are light. Export business shows a distinct improvement.

General Chemicals

ACETONE is in steady demand and price is very firm at £62 per ton for small quantities, with advantages to larger buyers.
ACID ACETIC is firm and unchanged at £37 to £38 per ton.
ACID FORMIC is quietly steady at £46 to £47 per ton for 85% technical quality.
ACID LACTIC is unchanged at £42 to £43 per ton for 50% by weight.
ACID OXALIC.—Demand is rather quiet, but price is firm at about £30 per ton.
ALUMINA SULPHATE.—Unchanged at £5 10s. per ton for high grade quality.
AMMONIUM CHLORIDE.—The market is lifeless.
ARSENIC is unchanged.
BARIUM CHLORIDE has been in better demand at £8 10s. to £9 per ton.
COPPER SULPHATE is in fair demand at about £24 per ton.
EPSOM SALTS is a little easier at about £4 7s. 6d. per ton to £4 10s.
FORMALDEHYDE is in good demand at £40 to £41 per ton.
LEAD ACETATE is quietly steady at £43 for white and £42 for brown.
LEAD NITRATE is unchanged.
LIME ACETATE is without feature.
METHYL ACETONE is in fair demand at £54 to £55 per ton.
POTASH CHLORATE is unchanged.
POTASH PERMANGANATE is lower in price at 6½d. per lb. for B.P. grade.
POTASH PRUSSIATE is unchanged at about £65 per ton.
SODA ACETATE is in better demand, and is quoted £18 10s. per ton on the spot.
SODA BICHROMATE.—Unchanged at 3¼d. per lb.
SODA CHLORATE is in good demand at about £25 per ton.
SODA HYPOSULPHITE.—Unchanged.
SODA NITRITE is in fair demand at £19 10s. per ton.
SODA PHOSPHATE is unchanged.
SODA PRUSSIATE is firm at 4½d. per lb.
SODA SULPHIDE is slow at £11 10s. per ton.
ZINC SULPHATE is unchanged.

Coal Tar Products

The coal tar product market is quiet, and there is little change in values to report from last week.

90's BENZOL is quoted at 1s. 4d. to 1s. 5d. per gallon, on rails, while the motor quality is quoted at 1s. 1½d. to 1s. 2½d. per gallon.
PURE BENZOL is worth about 1s. 7½d. to 1s. 8½d. per gallon, on rails.
CREOSOTE OIL is firm, the price in the North being 7½d. per gallon, on rails, while the price in London is about 8½d. per gallon.
CRESYLIC ACID is unchanged, at about 2s. 2d. per gallon, ex works, for the pale quality, 97-99%, while the dark quality, 95-97%, is quoted at about 1s. 11d. per gallon.
SOLVENT NAPHTHA is weak, and can be bought at about 10d. per gallon, on rails.
HEAVY NAPHTHA is worth about 11d. per gallon, on rails.
NAPHTHALENES remain steady, at about £6 15s. to £7 per ton, for the 74-76 quality, and at about £8 to £8 15s. per ton, for the 76-78 quality.
PITCH is steady. The demand remains satisfactory and supplies are rather scarce. To-day's value is 92s. 6d. to 95s. per ton, f.o.b.

Nitrogen Products

Export.—During the last week the export position has been rather quieter. The demand from the Continent has been a little less strong, and there have been no inquiries for prompt from the Far East. It is probable that their immediate requirements have been covered.

Home.—A few orders have been placed at the scale prices. Deliveries are being made somewhat slowly, as the manufacturers appear to be rather short of stock.

Nitrate of Soda.—The market has been a little firmer, and a large business has been reported at 16s. 7½d. to 16s. 9½d. per metric quintal, f.a.s. Chile, for spot, up to 16s. 11d. to 17s. for December, 16s. 9d. for January to March. The tone appears to be a little more hopeful, and producers are expecting a substantial increase in consumption next spring.

South Wales By-Products

THE South Wales by-product market remains featureless. Pitch, in anticipation of export demands, is the subject of small speculation. Creosote is scarce, but the demand is small and prices are unaltered. Solvent and heavy naphtha have a poor demand, buyers apparently holding off in expectation of still further falls in prices. Crude naphthalene continues in steady demand, with prices ranging from £5 10s. to £6 10s. delivered. The demand for patent fuel has increased, and the export is steady.

THE WORKS OF HADFIELDS, LTD., at Sheffield, were visited recently by Prince and Princess Ri of Japan, who have been making a tour of the country.

RECENT WILLS INCLUDE :—Mr. George William Pettit, of Northampton, managing director of Pettit and Sons, Ltd., chrome tanners, Northampton, £21,436 (net personalty £21,237).

WITH REGARD TO RUMOURS which have been published concerning the Branston Artificial Silk Co., it is officially stated that the Board is composed of the Marquis of Carisbrooke, Sir Edmund R. Turton, Mr. H. E. Garle, Mr. B. F. Conigrave, and Mr. S. H. Russell.

MR. F. A. ERNST, formerly acting chief of the Fertiliser and Fixed Nitrogen Investigations, and a member of the United States Fixed Nitrogen Research Laboratories staff, has resigned, and is now connected with the engineering staff of the Atmospheric Nitrogen Corporation, Syracuse, N.Y.

Calcium Cyanamide

CONSIDERABLE interest continues to be taken in this fertiliser for immediate delivery. Demands chiefly concern its use for autumn application for winter corn crops and grasslands and its inclusion in compound manures. As previously announced, the farmers' price for 4-ton lots for September delivery is £8 8s. per ton, carriage paid, to any railway station in Great Britain. The corresponding price for October delivery will be £8 10s. per ton.

A Silent Shaking Machine

AN efficient shaking machine (the "Technico"), which is claimed to work continuously yet silently, has been put on the market by A. Gallenkamp and Co., Ltd., of 19-21, Sun Street, London, E.C.2. The nerve-racking noise usually associated with these machines is, state the makers, obviated, and it is possible to work in comfort in a laboratory in which it is running. The carriage is suspended and the supporting stays work on ball bearings, and consequently there is no stress on any part.

Celanese and International Holdings

WITH regard to the payment of royalties by Celanese interests to the International Holdings and Investment Co., Ltd., it has been stated in the Press that an arrangement has been mooted under which such payments will cease. Although the present system will, it is suggested, be changed, the exact financial arrangements to be made are as yet unknown.

SWEDISH IMPORTS OF POTASSIUM NITRATE during the first six months of this year amounted to 47,262 kg., as compared with 40,348 kg. for the corresponding period in 1926.

AN ORDER TO THE VALUE OF 20,000,000 MARKS (£1,000,000) has been received from the Soviet Government by the German Otto Wolff concern for the supply of 50,000 tons of petroleum pipe line, which will be divided chiefly between the Vereinigte Stahlwerke and the Mannesmannröhen Werke.

GERMAN MAKERS OF NON-FERROUS METAL PRODUCTS, especially of brass and copper wares, have been negotiating an arrangement similar to those in operation in the steel industries. A draft agreement has now been completed to cover not only production, sales and prices, but also the formation of a buying organisation.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, September 20, 1927.

THE heavy chemical market continues to show improved activity, inquiry both for home and export business being good. Prices remain on about the same level as last reported.

Industrial Chemicals

ACID ACETIC.—98/100%, £65 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton. Powder, £36 per ton packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand and price advanced to about 8¼d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Quoted price unchanged at 1s. 6d. to 1s. 6¼d. per lb., less 5%, ex store. Continental now offered at 1s. 6¼d. per lb., less 5%, ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d., per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80%.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Rather dearer. Continental material now offered at 3¼d. per lb., ex wharf. Spot material still available at 3¼d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In poor demand, but price unchanged at about 1s. 3d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 5s. per ton, c.i.f. U.K. ports; crystal meal, 10s. per ton less. Lump quality on spot offered at £9 per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA, LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture unchanged at £23 to £24 per ton, ex station. Continental about £19 10s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture now rather dearer at £17 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material available at about £21 per ton, ex store. Offered for prompt despatch from mines at £20 per ton, ex wharf.

BARIUM CARBONATE, 98/100%.—Continental material unchanged at about £7 10s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers £8 per ton, ex station, minimum 4-ton lots. Spot material, 10s. per ton extra. Continental on offer at £7 5s. per ton, ex wharf.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 to £5 5s. per ton, ex store with a slight reduction for contracts. Continental rather dearer at £3 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—British material quoted £24 5s. per ton, ex store, spot delivery. Continental about £23 per ton, ex wharf.

FORMALDEHYDE, 40%.—Unchanged at £38 per ton, c.i.f. U.K. ports. Spot material quoted £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Continental material now quoted £29 10s. per ton, ex store.

LEAD, WHITE.—Quoted £30 per ton, ex store.

LEAD ACETATE.—White crystals on offer from the Continent at £40 per ton, c.i.f. U.K. ports. Brown about £38 15s. per ton, c.i.f. U.K. ports. Spot material on offer at £43 5s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC, 88/92%.—Solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15-ton lots. Under 15-ton lots, £29 10s. per ton. Liquid, £15 per ton, minimum 15-ton lots. Under 15-ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4¼d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Unchanged at £27 5s. per ton, ex wharf, prompt shipment. Spot material quoted £28 10s. per ton, ex store; 80/85%, calcined quality on offer at £20 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—Powdered quality quoted £22 10s. per ton, c.i.f. U.K. ports. Crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Rather cheaper and now offered at £20 per ton, c.i.f. U.K. ports. Spot material quoted £21 5s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6¾d. per lb., ex wharf.

SODA CAUSTIC.—Powdered, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station. Minimum 4-ton lots, on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—English material now quoted £21 per ton, ex store. Continental on offer at £17 5s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined, recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store. Minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of British manufacture quoted £15 5s. per ton, ex station, 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4¼d. per lb., ex store. Offered for prompt shipment from the Continent at 4⅛d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—Prices for English material as follows:—60/62%, solid, now £10 10s. per ton; broken, £11 10s. per ton; flake, £13 5s. per ton; crystals, 31/34%, £7 10s. per ton to £8 5s. per ton, according to quality delivered your works, minimum 4-ton lots on contract. Prices for spot delivery 5s. per ton higher for solid, 2s. 6d. per ton for crystals. Offered from the Continent at about £9 5s. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 per ton; rock, £11 per ton; floristella, £10 15s. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material now quoted £11 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Intermediates

BETA NAPHTHYLAMINE.—3s. 4d. per lb. Some inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Fair inquiries.

SODIUM NAPHTHIONATE.—1s. 8¼d. per lb., 100%. Small inquiries.

H. ACID.—3s. per lb., 100%. Some inquiries.

ORTHONITRANILINE.—5s. 9d. per lb. Some inquiries.

U.S. Government Search for Potash

THE first report of the United States Government on drilling in search of potash in the Texas field has been made public, and (states *The American Fertiliser*) "is interesting but not particularly encouraging." The test well was driven in the extreme south-eastern corner of New Mexico, near the Texas border, and was 1,847 ft. deep. Fourteen beds of potash were encountered between depths of 838 ft. and 1,770 ft. These ranged in thickness from 1 in. to 74 in., and in K_2O content from 3·10 to 16·47 per cent. Eleven of the beds consisted of polyhalite and three of carnallite. The four beds with an average content of over 10 per cent. of K_2O were respectively 1, 3, 8, and 17 in. thick. The official report states that the beds found "are probably not rich enough to have present commercial value."

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, September 22, 1927.

The chemical market here continues to display rather more life and in this respect appears to be sharing in the slight general improvement in industrial conditions which are now being reported from various centres. So far as business here is concerned, however, the quietness in the cotton industry has a markedly restrictive influence on the movement of chemicals for use in the cotton and allied printing and finishing trades. In other respects there are signs of buying opening out a little.

Heavy Chemicals

A quiet trade is being done in Glauber salts at from £3 5s. to £3 7s. 6d. per ton. Bichromate of soda is fully held at about 3d. per lb. and the demand for this remains moderately active. Chlorate of soda is still on the easy side although at 2¾d. per lb. prices have not actually changed much. Home trade quotations for bicarbonate of soda are at £10 10s. per ton and a fair inquiry has been met with. Alkali keeps very firm and a steady business is being put through on the basis of £6 15s. per ton. A similar position obtains in respect of caustic soda, the range of prices for this material being from £14 10s. up to £16 10s. per ton. The demand for hypo-sulphite of soda is on rather quiet lines, but the general level of values is maintained; photographic quality is being offered at about £16 10s. per ton and commercial at £9 10s. to £9 15s. Phosphate of soda is steady at £12 15s. per ton, but there is only a quiet trade passing in this at the moment. Sulphide of soda moves off in relatively limited quantities, but there are fewer signs of weakness than there has been for some little time; commercial is offering at about £8 10s. per ton and 60–65 per cent. concentrated solid at £10 5s. to £10 10s. With regard to saltcake moderate sales are being effected at from £3 7s. 6d. to £3 12s. 6d. per ton. Only a quiet business is passing in the case of prussiate of soda, but prices are steady at round 4¼d. per lb. Nitrite of soda is attracting a fair amount of attention and values are well held at about £19 2s. 6d. per ton.

There is not much buying interest just now in permanganate of potash, current offers of which are at about 6½d. per lb. for the B.P. grade and 5½d. per lb. for the commercial material. Firmness is still a feature of caustic potash, a fair demand for which is being met with at up to £31 per ton. Inquiry for carbonate of potash is rather quieter just now, but values are steady at £26 15s. to £27 per ton. Sales of bichromate of potash are on a quietly steady scale at from 4⅛d. to 4¼d. per lb. Yellow prussiate of potash is moving off in comparatively limited quantities and round 6⅝d. per lb. is now being quoted here. Chlorate of potash has an easy tendency at about 2⅞d. per lb. and there has been no noticeable improvement in the amount of business put through.

Arsenic continues in rather short supply, although there is perhaps less inquiry for this at the moment; quotations, however, keep steady at about £17 10s. per ton at the mines for white powdered, Cornish makes. Sulphate of copper meets with a moderate demand with current values at about £24 15s. per ton, f.o.b. Acetate of lead is slow, but prices are about unchanged on the week at £42 per ton for white and about £40 for brown. Offers of nitrate of lead are at £38 per ton or thereabouts without attracting much buying interest. Supplies of acetate of lime are not too plentiful and quotations are firm in consequence, with grey at about £15 15s. per ton and brown at £9 5s.

Acids and Tar Products

There is not much change in tartaric acid, although, if anything, values are a trifle weaker at 1s. 2⅝d. to 1s. 3d. per lb.; with only a quiet trade being done. Citric acid is inactive, but at 1s. 6⅝d. per lb. prices are held at about last week's level. Acetic acid is steady and in moderate request at about £67 per ton for glacial and £36 to £37 for the 80 per cent. commercial. Oxalic acid is maintained and moderate quantities are being disposed of at 3½d. to 3¾d. per lb.

Generally speaking, the by-products are quiet, although prices, with the exception of pitch, are maintained all round. Export demand for pitch has not yet developed and quotations are now at about £4 7s. 6d. per ton, f.o.b. Carbolic acid is a quiet section, but with supplies of crude scarce prices of this and of the crystallised material are steady at 2s. 6d. per gallon and 8d. per lb. respectively. Creosote oil meets with a moderate amount of inquiry at 7½d. per gallon. Solvent naphtha is still in quiet demand at 11¾d. per gallon.

The Fertiliser Position in Russia

Consumption Less than Pre-War

The Presidium of the Supreme Economic Council of Russia has prepared a comprehensive report for the Soviet of Labour and Defence on the measures to be taken for the more extensive use and production of mineral fertilisers. In this report it is observed that hitherto too little attention has been paid to mineral fertilisers. In this respect it appears that the position of Russia to-day is even worse than it was before the war. In place of the pre-war 6·9 quintals per hectare of ploughed land in the Soviet Union, only 1·1 is now applied per hectare. In 1913 Russia required 696,000 tons of mineral fertilisers; but in the current year the consumption of mineral fertilisers will amount only to about 156,000 tons. While a considerable increase in the consumption of mineral fertilisers can be observed in Europe and America, Russia does worse than stand still. In pre-war times Germany required 166 quintals per hectare of ploughed land, but in 1923–24 this consumption had risen to 236 quintals per hectare. In 1913 France consumed 1,875,000 tons of superphosphate, and in 1924 2,106,000 tons. The notable increase in western Europe, however, has been in the consumption of nitrogenous fertilisers. Germany used 508,000 tons of ammonium sulphate in 1913, and 1924 1,196,000. The considerable consumption of mineral fertilisers produced also a considerable increase in the harvest compared with the Russian yield.

A great obstacle to the use of fertilisers in Russia is the high cost, which has increased as a result of growing trading costs, which have reached an increase of 100 per cent. The report quoted from calls attention to the almost complete absence in Russia of systematic propaganda for agriculture, and the necessity of a radical reorganisation of farm propaganda is emphasised; and, again, the report makes note of the necessity of enlisting the co-operation of the small co-operative societies as well as joint action among farmers themselves.

Russian Potash Production Possibilities

Russian economists, however, have become suddenly interested in fertilisers from another point of view, namely, as producers and possibly exporters of potash. Experimental boring over a large area in the Solikamsk district has confirmed expectations of the existence of potash in large beds.

In fact, the intervals between distances at which potash has been found lead to the confident statement that Russia will soon be in a position to export potash salts on competing terms with any other potash-producing country. This expectation is based first on the shadow depth at which the potash beds lie; and second on the cheap water carriage by which the goods may be delivered at Leningrad port. A controlling committee is being formed and a shaft will be sunk at a near date.

Autumn Trade Prospects

The views of a number of business men as regards the country's trade outlook for autumn have been canvassed by the *Financial News*. Sir Robert Hadfield, in his statement, laid stress on the fact that the Trades Union Congress had decided to cultivate industrial fellowship. That being the case, then there was indeed a brighter future in store for the autumn; and, it was to be hoped, for many autumns to come. If we all united in regard to co-operation and work, then the result would be a great bound upwards. Sir Hugh Bell was of the opinion that any endeavour to forecast the prospects of industry in Great Britain in the coming autumn and winter must take into account two main influences. These were respectively the "domestic" and the "world" aspect of the questions. The problems they presented were no doubt in a very large measure the consequence of the war. The industrial condition of the autumn and winter depended upon the way in which these two problems were treated. A grim determination on the part of all to exercise the sternest self-denial and put in the longest tale of work presented the great remedies.

Company News

BROKEN HILL SOUTH MINES.—A dividend of 1s. per share is announced.

ELLIOTT'S METAL.—A dividend of 10 per cent., less income tax, is announced on the ordinary shares, payable on September 27.

ACHILLE SERRE.—An interim dividend at the rate of 10 per cent. per annum is announced on the ordinary shares for the past half-year.

AMERICAN CYANAMID.—The net profits for the year ended June 30 were $1,356,232, and $1,362,173 were brought forward. After providing for the dividends and writing $117,539 off plant, $1,836,482 were carried forward.

SHEEPBRIDGE COAL AND IRON CO.—A net profit of £116,417 is shown for the year ended June 30 last. A final dividend of 5 per cent., making 7½ per cent., less tax, against 5 per cent. for the preceding period, is recommended on the ordinary shares, and a balance of £87,233 is carried forward.

STAVELEY COAL AND IRON CO.—The company's report for the year ended June last shows a net profit, after allowing for depreciation and taxation, of £244,977, against £158,588. The final dividend is 5 per cent., making 7½ per cent., tax free, for the year, the carry forward being £73,970, as compared with £75,560 brought in.

ROOIBERG MINERALS DEVELOPMENT CO.—For the year ended June 30 last, the profit amounted to £32,900 (against £18,428). Dividends totalling 12½ per cent. have been paid (against 5 per cent.), absorbing £22,500, a transfer of £8,000 is made to reserve (the same), taxes require £3,272, new plant £399, and the option on Century Tin claims £50. The balance forward is £19,766 (against £19,962).

PARTINGTON STEEL AND IRON CO.—A net loss of £289,716 was sustained by the company for the year ended June 30, (against £141,354 for 1925-26), and there is now an accumulated debit on profit and loss account of £375,137. In their report the auditors point out that depreciation of plant has not been written off and that the investments and advances (shown at £139,208) have not been valued. The dividend on the six per cent. preference shares is in arrear as from June 30, 1925.

HARBENS (VISCOSE SILK MANUFACTURERS), LTD.—The trading profit for the year ended April last, after transferring £37,571 to experimental and development account, amounted to £9,773, and after providing for debenture interest, £7,146 remains to be carried forward. The report states that trading commenced on a normal basis at the end of 1926, and rather more than nine tons of yarn are being manufactured each week. Practically the whole of this year's output has been sold, and large contracts have been taken for next year. Following the increase in the company's capital in May last, additional plant is now being installed which will increase the output to 18 tons per week.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS FOR TECHNICAL PURPOSES.—A firm in Prague desires to secure the representation, on a commission basis, of British manufacturers or exporters. (Reference No. 239.)

CHEMICALS.—A firm in Milan desires to secure the representation for Lombardy alone or for the whole of Italy, of British manufacturers of salt cake, sulphate of ammonia, sulphate of copper, sulphate of nickel, carbolic acid crystals, carbonate of ammonia, prussiates of soda and potash. The firm also desires to get into touch with exporters of shellac. Corresponds in English. (Reference 241.)

SOYA BEAN OIL.—A firm of commission agents in Valparaiso, Chile, is desirous of securing the representation of British manufacturers or exporters. (Reference No. 251).

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to October 7, 1927.

FELTONE.

477,206. Class 1. Paints, enamels, colours, oils, varnishes, and distemper. Dixon's White, Ltd., Albion Wharf, Old Ford Road, Bow, London, E.3; manufacturers. January 27, 1927. (By Consent).

NEWINLAC.

482,726. Class 1. Lacquers. Winsor and Newton, Ltd., 37, Rathbone Place, London, W.1; manufacturing artists' colourmen. July 26, 1927.

GLISTOLAC.

482,830. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. Burrell and Co., Ltd., Burrell's Wharf, Millwall, London, E.14; and 40, Trinity Square, London, E.C.3; colour and varnish makers, oil boilers and refiners. July 29, 1927. (To be Associated. Sect. 24.)

ZITYSIL

482,915. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. Lysol, Ltd., Lysol Works, Kingston Road, Raynes Park, London, S.W.20; manufacturers. August 3, 1927.

Opposition to the Registration of the following Trade Marks can be lodged up to October 21, 1927.

MORNING STAR.

482,041. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Billingham, Stockton-on-Tees; chemical manufacturers. June 30, 1927.

ORION.

482,046. Class 1. Chemical substances used in manufacture, photography, or philosophical research, and anti-corrosives, but not including varnish, enamel and paint, and not including any goods of a like kind to any of these excluded goods. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Billingham, Stockton-on-Tees; chemical manufacturers. June 30, 1927. (To be associated, Sect. 24.)

ORION.

482,048. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Billingham, Stockton-on-Tees; chemical manufacturers. June 30, 1927. (To be associated, Sect. 24.)

TELLUS.

482,051. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Billingham, Stockton-on-Tees; chemical manufacturers. June 30, 1927. (To be associated, Sect. 24.)

Arsenic from Flue Dust

"I DOUBT if it is generally known that arsenic may be present in such quantities in the dust from factory and other chimneys. It is also possible that in manufacturing towns with a large number of factories and with certain kinds of coal, even larger quantities of arsenic may be present than are recorded." This statement is made in a report by the Medical Officer of Health for St. Pancras following a complaint regarding the quantity of dust discharged from chimneys of the Council's electric light works. Tests were made at the electricity works and at three factories in the borough, and the highest percentage found was 500 parts per million at one of the factories. "The smallest fatal dose of arsenic is two grains," says the report, "and it would require more than half a pound of the flue dust obtained from factory B (which contained the highest percentage) to yield two grains of arsenic."

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

CROCKATT (JOHN), LTD., Leeds, dyers and cleaners. (M., 24/9/27.) Registered September 8, £900 mortgage, to Building Society; charged on 297, Legrams Lane, Bradford. *£11,463. February 9, 1927.

Satisfactions

ELSTREE BLEACHING AND DYEING CO., LTD., Luton. (M.S., 24/9/27.) Satisfaction registered September 9, £3,600, registered December 5, 1924.

LUCE'S EAU-DE-COLOGNE CO., LTD., Southampton. (M.S., 24/9/27.) Satisfactions registered September 12, all moneys, etc., registered September 13, 1918; and £7,000 (not ex.), registered September 14, 1921.

Receiverships

GRAYS DYES AND COLOURS, LTD. (R., 24/9/27.) E. Sudworth, F.C.A., 35, Westgate, Huddersfield, chartered accountant, has been appointed receiver by the debenture holders.

NORWOOD WHARF CHEMICAL CO., LTD. (R., 24/9/27.) F. R. Jutsum, of "Wychling," Morgans Lane, Hayes End, Middlesex, ceased to act as receiver or manager on September 4, 1927.

London Gazette, &c.

Winding Up Petition

CORBYN STACEY AND CO., LTD. (W.U.P., 24/9/27.) A creditors' petition for winding-up has been presented by Henderson and Liddell, Ltd., 33, Eastcheap, London, sugar dealers, and is to be heard at the Royal Courts of Justice, Strand, London, on October 18.

Companies Winding Up Voluntarily

ELSTREE BLEACHING AND DYEING CO., LTD. Meeting of creditors at the offices of B. Laporte, Ltd., Kingsway, Luton, Beds., on Monday, October 3, at 3 p.m.

GRAYS DYES AND COLOURS, LTD. (C.W.U.V., 24/9/27.) E. Sudworth, F.C.A., 35, Westgate, Huddersfield, chartered accountant, appointed as liquidator, September 13.

New Company Registered

METALLURGICAL PROCESSES, LTD. Registered as a "private" company on September 15. Nom. capital, £28,750 in 25,000 8 per cent. cumulative participating preference shares of £1 each and 75,000 ordinary shares of 1s. each. To acquire and turn to account patents, processes, and concessions, and to carry on the business of engineers, founders, machinists, manufacturers, chemists, etc. Directors: Sir Godfrey Fell (chairman), J. Guardiola, W. H. Tait, and C. See, 25, Cleveland Gardens, London, W.2.

The Dead Sea Concession

It has been freely stated recently that the concession for exploiting the Dead Sea is on the point of being granted. No official announcement on the subject has, however, yet been issued, and inquiries made in the Government Departments concerned indicate that no further information is yet available; nor is it known when it will be possible to make a definite statement. It is therefore to be presumed that negotiations are still proceeding.

Canadian Ammonium Sulphate. 1926

According to information compiled by the Dominion Bureau of Statistics at Ottawa, the production of ammonium sulphate in Canada during 1926 amounted to 23,655 tons, valued at $1,015,578, as compared with 18,251 tons, worth $909,097, in 1925. All the ammonium sulphate made in Canada is produced as a by-product of the coke and artificial gas plants. The bulk of the Canadian production is exported to foreign countries for use as fertiliser. In 1926 exports totalled 16,382 tons, worth $813,115, as compared with 12,560 tons, valued at $637,310, in 1925. The principal countries of destination with the quantities and values of Canadian export to each were as follows:—Japan, 8,202 tons, worth $416,110; China, 3,185 tons, at $151,520; Barbados, 1,620 tons, at $85,901; British Guiana, 1,839 tons, at $83,958; Cuba, 530 tons, at $26,645; United States, 512 tons, at $24,960; Hong Kong, 159 tons, at $8,596; other countries, 336 tons, at $14,425. Considerable quantities of ammonium sulphate are also imported into Canada. During 1926 about 2,298 tons, worth $135,455, were brought in; the bulk of this came from the United States. In 1925 the imports were only 398 tons, worth $27,544. The six companies in Canada making ammonium sulphate during 1926 were located as follows:—Algoma Steel Corporation, Ontario; Steel Company of Canada, Ltd., Hamilton, Ontario; Hamilton By-Product Coke Ovens, Ltd., Ontario; Dominion Iron and Steel Co., Ltd., Nova Scotia; Granby Consolidated Mining, Smelting, and Power Co., British Columbia; Montreal Light, Heat, and Power Co., Ltd., Montreal.

Oil Find in Australia

Recent news from Australia states that a petroleum field may have been discovered. In the past few days the gas pressure in the bore at Roma, Central Queensland, has increased to 450 lb. per sq. in. Liquid gas was met with, and forced the slush 40 ft. up the derrick. The gas was immediately controlled by sealing the borehead. It had a strong smell of petrol, while the noise of its escape was heard several miles distant.

"Ethyl Petrol" to be Marketed

According to a statement in the *Manchester Guardian Commercial*, the Anglo-American Oil Co. should be marketing in a few weeks an ethyl brand of petrol—that is, an ordinary petrol to which has been added an "anti-knock dope." Ethyl petrol is at present being sold by the Anglo-American Oil Co. to the Royal Air Force and to the owners and builders of racing motor boats.

Benn Brothers' Other Journals

The Cabinet Maker.—Birmingham Number: Progress of Fashionable Furnishing; Autumn Programme of Technical Instruction; Round the Birmingham Trade; The Carpet Industry of Kidderminster.

The Electrician.—"Transport on the Farm," by R. Borlase Matthews; Organisation of the Electrical Industry; The National Radio Exhibition.

The Fruit Grower.—"Some Early Cherries," by H. B. Bagenal; "A Weevil Pest of Strawberries," by S. Stuart Light; Ultra-Violet Rays and Plants.

Gardening Illustrated.—A Great Dahlia Exhibition (Illustrated); Brooms and Rock Brooms; Fruit Growing for Profit; Indoor Plants; Cyphomandra betacea (the Tree Tomato).

The Gas World.—Gas Salesmanship; "Lights in Traffic Control," by the Chief Constable of Leeds; Methods of Charging for Gas.

The Hardware Trade Journal.—New Season for Radio Goods: Preparations and Plans; What to see at the Radio Exhibition; "How I Handle Radio Goods," by a successful Retailer; British Hardware Production.

The Timber Trades Journal.—Finnish Reply to Importers' Criticisms; Forest Auctions in Latvia; The Practice of Overcutting; The Idle Machine.